PATWARI AND CHAUKIDAR: SUBORDINATE OFFICIALS AND THE RELIABILITY OF INDIA’S AGRICULTURAL STATISTICS

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The Report shows inadequate appreciation of the way in which the primary statistics of India are collected. It is the hopeless inefficiency at the bottom, even more than the failure to collate them properly, that renders many of the statistics of India of so little value. In Sind, for example, there is nominally a census of agricultural livestock taken every four or five years. Actually there is no expenditure made on this census, and the figures are evolved by the village accountant out of his own inner consciousness. He takes the figures of the last census, assumes that they must have been correct at the time they were produced, and adds or subtracts what he, only too justly, thinks is a figure which will not evoke comment. The figures of the preceding census were... arrived at in exactly the same way, and if the present figures have any relation whatever to the truth, the fact is to be attributed to Providence working in a more than usually mysterious way. For the true interpretation of Indian statistics a knowledge of [the administration of any Indian district] is at least as important as the knowledge of statistical and economic theory.

H. Dow, ‘Imperial Secretariat Note’ (1934)

Because they make possible comparisons between nations and comparisons over time, indices of gross national product or per capita income have always fascinated politicians and the public. Our whole interpretation of India’s economic history has come to turn on their neat translation of an extraordinarily complex subcontinent’s economic condition into ‘simple and easily remembered numerals’. Was it a history of successful growth or disastrous decline? The statisticians promise to provide the answer. But the entire validity of the national income accounting approach to modern Indian economic history depends upon the reliability of the primary output data, especially the official agricultural statistics, given the agricultural sector’s dominance in the Indian economy. Until very recently analyses of these statistics—steadily moving towards greater detachment from, and higher methodological standards than, their polemical origins—were reassuring.
Confidence in the agricultural statistics' ability to provide the answers statisticians asked of them culminated in the most impressive quantitative research on Indian agriculture to date—George Blyn's *Agricultural Trends in India, 1891–1947*. In the shifting quicksands of Indian historiography, Blyn offered—or appeared to offer—definitive trend rates for agricultural output, availability, and productivity backed by an impressive statistical apparatus, a laborious mass of computation, and painstaking adjustments for the data's eradicable defects.

The fact remains, however, that none of the statisticians who used the official agricultural statistics ever tried to discover the errors (and margins of error) to which they were subject, by consulting the files in Indian archives—or even the published settlement and departmental administration reports—in which the Indian civilians responsible for their collection discussed the agricultural statistics' limitations. Economic historians have only just begun to realize how serious the deficiencies of the system for the collection of agricultural statistics really were. M. M. Islam has arrived at trend rates for Bengal not only substantially different from Blyn's, but subject to the reservation that it may not be possible to arrive at reliable trend rates at all. It can be argued that the Bengal statistics were exceptionally unreliable; Blyn himself acknowledged their inaccuracy. But detailed research on the collection of agricultural statistics in two other provinces—the Punjab and Bombay—in which they might reasonably have been expected to be most accurate has confirmed that the margins of error involved in the official statistics were so large and so ineradicable that trend rates based upon them must be regarded, at best, as highly approximate guides to India's agricultural growth. What comparison of a temporarily-settled province like the Punjab with a permanently-settled province like Bihar shows is that the sources of error, if not always the margins of error, were much the same all over India.

**Sources of Error**

**Crop Areas: The Incompetence of the Primary Reporting Agency**

The government are very keen on amassing statistics—they collect them, add them, raise them to the nth power, take the cube root and prepare wonderful diagrams. But what you must never forget is that every one of these figures comes in the first instance from the chowkydar [sic] who just puts down what he damn pleases.

*Lord Stamp, Some Economic Factors in Modern Life (1929)*

The accuracy of the official agricultural statistics was directly related to the efficiency of the agency through which they were collected. In temporarily-settled provinces crop areas were reported by patwaris, the
village accountants responsible for maintaining each village’s land revenue records. In permanently-settled provinces, where the state collected its revenue through large landlords rather than directly from the petty cultivator, the patwaris were the landlords’ servants; and the state was compelled to collect statistics of crop areas through the only servants it employed at village level—the chaukidars, or village watchmen. Of the two, the patwaris—all authorities agree—were the more efficient reporters of ‘agricultural facts’. Both, technically, were village servants; but there was a social gulf between them. The patwaris belonged to the highest reaches of village society. They were members of rich peasant families, or the families of successful moneylenders and traders. Their caste status was comparatively high; and their control of the land revenue records (especially in areas where the land revenue fluctuated according to the patwaris’ reports of harvest out-turn, or disputes between landlords and tenants were settled by the patwaris’ entries in the village record of rights) gave them power over their fellow-villagers, who found it necessary to bribe them. Above all, they were literate and numerate. As time went on candidates for patwariships needed ever-higher educational qualifications; while an increasing number of patwaris underwent vocational training in special patvari schools.

The chaukidars, in contrast, were members of economically-depressed families and socially-despised castes. Often they became chaukidars because they were too physically infirm to work as labourers, and lacked the capital to set themselves up as tenants. They were illiterate and quasi-numerate; and they made their reports on crop areas orally, at their local police station. They were handicapped by the absence of village maps giving the area of each field. In temporarily-settled areas, all a patvari had to do to work out the total area under any crop was add up the areas of all the fields in which it was grown: the area of each field was given on his village map, and again in his village papers. The chaukidars had to guess: no one knew the area of the fields in Bengal, and there was no question of actually measuring the crop. There was also less likelihood that the chaukidars’ guesses would ever be checked. The patwaris’ immediate superiors were revenue officers—kanungos and tehsildars—whose ordinary work of revenue collection compelled them to keep in touch with the condition of each harvest, and with longer-term agricultural changes. They were perfectly capable of checking the patwaris’ work; they were obliged to do so as a matter of administrative routine; and it was comparatively easy for them to do so, by checking the crops growing in selected fields against the entries in the patwaris’ registers. The policemen who were the chaukidars’ immediate superiors had neither the opportunity nor the incentive to scrutinize the figures the chaukidars reported.
Officials in Bengal (Bihar was part of Bengal till 1912) were acutely conscious that the lack of field surveys and patwaris in the province prevented their collecting reliable agricultural statistics; and every time the Government of India pressed them to provide agricultural statistics, they protested against having to perpetrate a fraud. In 1868—when the first uniform returns of crop areas were circulated to local governments—the Board of Revenue and the divisional commissioners, the entire upper echelon of the land revenue administration, insisted that the only data they could collect would be obsolescent or conjectural. Fifteen years later the Statistical Conference which met to revise the 1868 tables specifically excused the government of Bengal, on the ground that 'reforms in the manner of exhibiting facts can be of no great value in a province where no suitable agency exists for ascertaining facts'. Successive directors of land records and agriculture, after the creation of their post in 1885, fought a rearguard action against the Government of India’s weakness for all-India statistical returns, however inaccurate the figures they contained; but the local officials’ scruples were finally overridden, and the Royal Commission on Agriculture in India stigmatized the resultant statistics as not merely guesses, ‘but frequently demonstrably absurd guesses’.

The Bengal Tenancy Act of 1885 made the lack of patwaris and village surveys more apparent. The young civilians whose talent and commitment led to abandonment of the traditional policy of détente with the zamindars appreciated that the rights which the Acts conferred on tenants would be ineffectual unless the tenancy were also provided with incontrovertible legal evidence of the size, rental, and age of their holdings. Public registries of rights in land—the kind of village records of right drawn up in the course of settlement operations in temporarily-settled areas, and kept up to date by the patwaris—were the obvious means of enabling the tenant to withstand his landlord’s vakils, goondas and jeth raiyats. The first experimental survey intended to test the feasibility of creating village records of right was completed in north Bihar in 1888, and settlement operations (settling rents and rights rather than revenue and rights, as they would have done in a temporarily-settled province) gradually spread to each district of Bihar. This rent-settlement held out the promise of a radical improvement in the quality of the official agricultural statistics. While the settlement of each district was in progress, settlement staff collected figures for crop acreages which were more accurate than any of the chaukidars’ estimates, being partially based on actual measurement; surveys were made of each village, and maps prepared showing the area of every field; experimental crop-cuttings were taken to ascertain crop yields. But the full potential of the Bihar settlements was never realized. Because there
was so little they could do with them once they had them, settlement officers were not much interested in collecting reliable statistics of agricultural output: their primary functions—the registration of rights and the adjustment of rents—were too all-engrossing. Their estimates of yield, accordingly, were ‘not only incorrect but absurd’.  

In districts exposed to famine, the Bihar settlement officer was supposed to use estimates of output to work out the amount of relief likely to be required in future scarcities; but it was impossible to do this with any degree of precision, and settlement officers generally relied on past experience to determine how much relief would be required, and worked backwards from that to decide what crop yields should be in the light of a district’s economic history. In the 1870s the government of Bengal lacked the agricultural statistics it needed to forecast famines, or gauge the amount of relief required by famine-stricken areas; in the 1940s, at the time of the last great Bengal famine, the necessary statistics were still unavailable. Settlement officers also, nominally, needed reliable figures for output to commute the landlord’s share of kind rents into cash. Actually, the great majority of commutations represented compromises between landlord and tenant based on the prevailing cash rents for similar holdings nearby. If either party refused to compromise, the impossibility of discovering how much produce the landlord had taken in the past forced settlement officers to sample the yield of a single harvest; and this kind of spasmodic crop cutting, concentrated in particularly litigious estates, lasting only one harvest, was no basis on which to calculate the average yields of entire districts over long periods. Many districts, moreover, were secure from famine and had few kind rents; in such tracts settlement officers were known to abandon the pretence of calculating the output of each crop. Even the data the settlement officers did collect were under-utilized. Sometimes their acreage figures were incorporated in the regular returns of agricultural statistics; sometimes they were not. The field maps were either not issued to the chaukidars, or the chaukidars were incapable of using them. And all the settlement data—acreage figures, maps, crop cuttings—soon became out of date. Bengal officials mastered the difficulties of an efficient rent settlement; they never succeeded in devising an agency through which the settlement records could be—as the phrase goes—‘continuously maintained’. 

The first attempts to create an agency capable of keeping the settlement records (and so the agricultural statistics) up to date were directed towards reviving the defunct patwari system of Bengal. In certain areas—notably Bihar—there were still large numbers of patwaris paid by the landlords and appointed and dismissed by the collectors. The regulations requiring them to file annual papers in the collectors'
kutcheries showing the rental and holding of each ryot were still un-
repealed. Some patwaris occasionally filed papers; but they were very
unreliable, and no use was ever made of them. What made it impossible
for the collectors to compel every patwar to file reliable records were
the difficulties of dismissing patwaris once they had been appointed.
The courts in Bengal—always ready to hamper the executive govern-
ment—decided that patwaris had a legal right to their office unless the
collector could prove they had systematically neglected their statutory
duties, and few collectors were prepared to embark on a whole series
of such lawsuits in which they would be required to justify their
decision to dismiss up to the hilt. The zamindars had a little more
influence over the patwar, but 'cases are not wanting in which a dis-
honest patwar in collusion with the raiyats can do much to defraud the
proprietor of his rights'. 23 The zamindar might pay the patwar his
salary; but the patwar's salary was only a fraction of his total income.

His position in the village enables him to get hold of the best lands and to enter
them in the rent roll either in his own name, or in that of his relatives. In the
case of lands abandoned by their original occupants, he is often able to relet
them without the landlord's knowledge and to appropriate the rents. His per-
quises are not inconsiderable. He gets a fee called tahār, amounting usually to
half an anna in the rupee on the rent paid, for any receipt which he issues to
the raiyats. A similar amount is levied on the occasion of the dewat puja, and
frequently on other festivals as well. In every fresh settlement of lands, or entry
of a transfer in the rent roll, he gets a salami; the amount varying with the
importance of the transaction and the position of the parties concerned. The
appraisement of crops on land paying a produce rent, the sale of the produce of
land cultivated by the landlord, and many other occasions in village life give
him opportunities for further adding to his income. 24

The system of dual control freed the patwar from both his ostensible
masters. He was sufficiently independent 'to give evidence and manipu-
late his papers in favour of the party who will make it most worth his
while'; 25 and his ability to 'play his own hand against both government
and landlord' wrecked the first experiments aimed at rehabilitating the
traditional patwar agency. As the earliest settlements in Bihar got under
way in the 1890s, the manager of the largest zamindari in Champaran
cooperated with the local settlement officer in an attempt to train the
estate patwaris to maintain the settlement records. Circumstances were
especially favourable. The Bettiah estate was under effective manage-
ment; and its patwaris were genuine village officials, because it owned
whole villages rather than fractions of villages, grouped together in
compact blocks. But the experiment still failed. 'Even among the first
batch of men', the settlement officer explained, 'it was found that very
few, who were registered patwaris, actually worked in the field. They
almost universally sent their relatives to act for them, on the plea that
they had urgent work to do for the landlords; and this, too, in spite
of the fact that they were allowed 4 annas daily to provide a substitute
for their ordinary work’. There was nothing the settlement officer
could do to compel them to attend: the courts decided that settlement
work was not part of the *patwaris’* statutory obligations, so no *patwari*
could be dismissed; and the majority of landlords were opposed to
legislation making settlement work part of a *patwari’s* statutory obliga-
tions, because it threatened to convert ‘their’ servant into a government
official.

The alternative to reform of the *patwari* was creation of a new agency
wholly paid and controlled by the state. Schemes for the creation of
such an agency were put forward in the 1870s, the 1880s, and the
1890s: all came to nothing. The great stumbling block was cost. The
governments of Bengal and Bihar were the poorest in British India.
The permanent settlement froze the largest source of revenue, the land
revenue, at levels fixed a century before, and the real value of the land
revenue fell when the rupee began to depreciate in common with all
silver currencies after 1880. This downturn in income coincided with
demands that the provincial administrations assume new responsibili-
ties, or discharge old responsibilities more fully. Each new impost
designed to finance these demands provoked violent political opposi-
tion, led by *zamindars* who denounced the government’s invasion of
their tax-immunities as a breach of the sacred contract implicit in the
permanent settlement; and the Secretary of State, rather than alienate
the most conservative element in Bengali society, twice vetoed cesses
which would have paid for a new *patwari* establishment. So the district
officers in Bengal–Bihar went on collecting agricultural statistics with-
out subordinates capable of collecting them, just as they went on
administering their districts generally with notoriously inadequate
establishments. The appointment of ‘circle officers’, after the report of
the Bengal District Administration Committee (1915) confirmed the
superficiality of British ‘control’, marginally improved the situation
in Bengal (not Bihar); but the provincial government’s (predominantly
urban) commitments expanded more rapidly than its tax base. Finally,
under the dual stress of war and famine, aggravated by poor com-
munications and weak leadership, Bengal’s ramshackle administration
collapsed. Seventy years after Sir George Campbell—Lieutenant-
Governor in the 1870s—launched his crusade against ‘under-administra-
tion’, the last Bengal Administrative Enquiry Committee repeated his
unimplemented recommendations.

So the Bengali reformers drew a blank: and the broad distinc-
tion between the hopelessly unreliable agricultural statistics of the
permanently-settled areas and the less unreliable statistics of the temporarily-settled areas persisted. This difference has always been known: Blyn made specific allowance for the irreconcilable divergences of rice yields in Bengal and Bihar. But what has never been sufficiently recognized is that the *patwaris* of temporarily-settled provinces like the Punjab were not so very different from the *patwaris* of Bihar. If one system of dual control made the Bihar *patwari* indisciplined and irresponsible, another system of dual control gave the Punjab *patwari* a similar independence. Ostensibly the servant of the village community and the state, the Punjab *patwari* eluded both his masters. He was the occupant of an hereditary office regarded as a species of freehold property to be enjoyed, not an efficient civil servant responsive to his immediate superiors' orders. His official salary was the smallest part of his perquisites; and if there were no legal obstacles to the dismissal of a Punjab *patwari*, there were none the less severe practical difficulties in finding suitable replacements. Certainly no Punjab *patwari* was ever dismissed for fabricating agricultural statistics: his official superiors never regarded them as important enough to warrant dismissal. So long as a *patwari* kept his land revenue accounts properly written up, he could fill up the returns of agricultural statistics prescribed by an infinitely remote imperial department in any way he chose, frequently repeating the same figures year after year, without fear of reprisal.

Even in a province as committed to efficient land revenue administration as the Punjab, where the revenue officer’s power and prestige stood higher than in any regulation province, the efficiency of the *patwaris* varied enormously, from district to district and from time to time. When the Government of India began insisting on a higher standard of agricultural statistics in the 1880s there was no *patwari* agency proper over quite large areas of the province—the hill districts (Simla, Kangra) and the districts of the North-West Frontier (Hazara, Kohat, Dera Ismail Khan, Bannu). These were districts that were always difficult to administer efficiently. Communications, because of the impossible terrain, were poor; and district officers along the frontier, preoccupied by the problem of peacekeeping among the turbulent border tribes, were forced to neglect routine district administration. As a result administrative practices borrowed from the settled districts of the plains remained foreign. Settling Hazara between 1868 and 1874, E. G. Wace discovered that there had been ‘a *patwari* cess, and officials called *patwaris* have been paid from it, and have been nominated to distinct circles, but they have not resided in their circles, and have been for the most part only settlement and revenue clerks kept at the *tahsil* or settlement headquarters’. Settling Simla ten years later, he discovered ‘*patwari* arrangements... of the roughest description...
'Patwari' and 'Chaukidar'

The twenty-three Simla villages... had no patwari, the Bharauli zamindar had his separate patwari, who was paid Rs 60 per annum. When Wace tried to recruit additional patwaries, he ran against the shortcoming of suitably qualified candidates in the more remote districts. There were very few men with the necessary (low) educational qualifications. Members of the commercial classes—the great reservoir of literacy—were reluctant to serve in remote districts, away from the society of their caste-fellows in the towns; and the British were reluctant to appoint them; they tended to be absentees, neglecting their work, and they tended, also, to use their power over the land revenue records to help their moneylending relatives exploit the peasant debtors. Few agriculturalists were attracted to the low salaries and poor prospects held out to patwaries, which also made it hard to maintain discipline once men had been appointed. Training of candidates was a further problem. Patwaries, ordinarily, were trained in the course of settlement by the settlement officers, but each district was settled on average once every twenty-five years, and if a district missed its chance (often because the provincial authorities refused to sanction the necessary expenditure), its patwari establishment could come down for fifty years or more. The old-established patwari agencies of the plains presented equally intractable obstacles to reform. Elderly patwaries were often capable of keeping up the basic land revenue accounts; but they were too old and too poorly educated to learn how to fill up the new returns of agricultural statistics after conscientious crop inspections. New patwaries—younger, better educated men—had to be found to take their place, and without always forthcoming. The supply of men with even the minimum qualifications, the settlement officer of Ambala complained in 1895, was 'barely up to the demand, though the schools were literally drained of every eligible schoolboy.' The hereditary claims of existing patwari families complicated the process of appointment. The sons and nephews of elder patwaries were regarded as having strong claims to succeed them in office, regardless of personal merit. The village factions to which they belonged, patwaries, often with village connections within the commercial castes, made things very difficult for any 'stranger' appointed to office in the district; and British revenue officers hesitated to appoint outsiders, just as outsiders hesitated to accept such appointments. Often particular families—real or mythical—controlled the local revenue business. In addition, the practice was also dominated by the patwaries and the British district officers, it was very difficult for a district officer to know what was really happening to the patwari.
agency, or to exercise effective control over it. No kanungo or tehsildar belonging to the same connection as one of his subordinate patwaris would denounce him for fudging his returns; and every kanungo and tehsildar belonging to the same faction as a candidate for office would unite in support of his application. Thus in Bannu patwaris notoriously fudged the agricultural returns, and were able to go on fudging them because they belonged to Hindu cliques in a district in which the Muslim agriculturalists—90 per cent of the population—were too ill-educated to take their place.\(^{34}\) In Hoshiarpur a single Brahman family of hereditary kanungos held thirty-three posts as patwaris in one tehsil (Una), and five posts as kanungos.\(^{35}\) In Gujranwala, when the settlement officer tried to break the Hindu moneylenders’ monopoly by appointing agriculturalists, the innovation ‘was looked upon by the Khatris, Aroras and Ulemas who had hitherto monopolized these appointments, as well as the kanungoships and most of the posts in the district office, as an encroachment on their monopoly, and the tehsildars and deputy superintendents were at first apt to be too critical of the new men. It will therefore be necessary for deputy commissioners hereafter to watch carefully future appointments, and see that things do not revert to their old groove.’\(^{36}\) And in Ludhiana the Sials ‘held almost every circle within ten or twelve miles of the city, besides nearly all the kanungo appointments. The patwaris of the Bet were of this tribe, and many of them carried on large moneylending businesses, openly in their homes, with the Muhammedan proprietors. It took a great deal of trouble to break up this clique, which was a very strong one, the Sials being the most clannish tribe in the district, and many of them being high up in government service; and I have no doubt that every means will be employed by them with a view to the recovery of their ascendancy.’\(^{37}\)

The effect of these connections was to relax the discipline essential if accurate agricultural statistics were to be collected. They made it possible for the patwaris to ignore the instructions regarding their collection painstakingly promulgated by the directors of land records. Where patwaris were so indisciplined that they flagrantly defied the British revenue officers by moneylending, or forged the entries relating to mortgages in their record of rights so that they or their relatives could use them as evidence in civil suits expropriating their peasant debtors, it was clearly impossible to compel them to keep up reliable registers of agricultural output.\(^{38}\) It was impossible, in particular, to compel them to live in their circles—as the patwari rules obliged them to do.\(^{39}\) Agriculturalist patwaris preferred to live in their natal villages; patwaris from the commercial castes preferred to live in towns. They paid fleeting visits to their circles, usually timed to coincide with their
superiors’ tours of inspections, and did their work in the most cursory way. If a patwari with his family lives in his circle, a settlement officer explained, he is almost certain to do his work well. Being generally a man of some intelligence, he will, when shut off from the amusements and distractions of the town, where, if allowed, he always chooses to live, necessarily occupy his thoughts with matters around him... The orders of the supervising officers will be the more readily carried out, because living on the spot of their execution, he finds them more easy to carry out; and he cannot help acquiring an intimate knowledge of his circle and of the circumstances of the zamindars, for the daily talk about him will be of little else.' But if patwaris were habitual absentees, crop statements were often filled up without seeing the fields, and instances come to notice of a patwari making one crop statement serve for two or more years without even taking the trouble to disguise the trick by a superficial alteration of the figures. Settlement officers frequently complained of fraudulent crop returns. In Karnal, for example, the girdawari ‘was often done in the village guest-house’ instead of in the fields; usually ‘by simply repeating the entries as to cultivation contained in that of the previous year. Some patwaris... paid the superior revenue establishment the compliment, which was probably undeserved, of supposing that this simple device might be detected, and only made the jamabandis of alternate years copies of each other.’ Not surprisingly, the resultant statistics were proclaimed ‘a farce, and the annual papers a fraud’. In other areas conscientious patwaris found it genuinely difficult to carry out accurate girdawaris. It took generations before the whole of the Punjab was accurately surveyed; and village maps soon became misleading between settlements, if cultivation changed. Sometimes the patwaris’ circles were too large to be easily inspected. This was the case in the hills, where patwaris were never expected to inspect every scattered patch of cultivation hidden up a ravine or on top of a hill; in the desert-like plains, where each revenue estate contained huge areas of wasteland, punctuated by isolated wells; and in districts where the cultivated area expanded faster than the patwari establishment. When irrigation from the Western Jumna Canal spread over Rohtak at the turn of the century, the settlement officer protested that the patwaris’ numbers were ‘insufficient and their abilities much below the average. The increase of irrigation, the reversion of fields of a reasonable size in which the girdawari can be a matter of accuracy instead of a farce, and the necessity for improving the standard of the records of the district and preventing a relapse to their normal state, furnished good grounds for asking for an increase in the staff. Unfortunately this was refused...’
Snow in the hills, heat in the plains, floods in the river valleys were all additional disincentives to accurate field inspections. But the critical factor determining the patwaris’ accuracy was the quality of the supervision they received. If their returns were regularly checked and mistakes punished, many patwaris were capable of compiling accurate statistics of crop areas. But the returns of agricultural statistics, as distinct from the revenue returns, were rarely checked. The patwaris’ immediate superiors, the kanungos and tehsildars, had better things to do. They preferred to devote their limited time and energy to efficient revenue collection and maintenance of reliable records of rights. Both had an obvious purpose; the agricultural statistics—in the eyes of the middle-ranking Indian revenue official—had none. Crop inspections were important only in areas under fluctuating assessments, where the land revenue demand each year was directly linked to the harvest. This was the case in the most insecure areas: areas where the crops were dependent on rainfall that might not fall, or river floods that might not rise. In such tracts, kharaba inspections—inspections of the extent of crop failure—determined the amount of land revenue remitted. A different kind of fluctuating assessment was also common in the most secure tracts: those irrigated by the great perennial canals. In the Punjab canal colonies cultivators were charged rates varying with the value of different crops on the areas they harvested. The irrigation department maintained a special patvari establishment specifically intended to conduct the crop inspections on which the canal revenue charges were based. But both these forms of inspection had their limitations. They were vulnerable to corruption. It was well worth the cultivators’ while to bribe the patwaris, so that deliberate fraud—the understatement of matured areas and mis-classification of the more valuable crops—replaced simple negligence. Peasants always resisted the introduction of fluctuating assessments in insecure areas because the knew the bribery it would involve; and the Punjab canal colony disturbances of 1907 were in large measure a peasant protest against the corruption of the subordinate officials with whom they came in contact. There is some suspicion also that, in the irrigated tracts at least, the patwaris’ normal inclination to under-report the area of crop failure ‘to save themselves trouble’ and favour government was reinforced by their immediate superiors’ determination to conceal extensive failures in case they reflected on their own mismanagement of the water supply.

To what extent bribery overcame this tendency to overstate matured areas is impossible to say.

The fluctuating assessments, moreover, never covered more than a fraction of the total cultivated area. Over the rest of the Punjab the kanungos and tehsildars never realized their responsibility for the agricul-
tural statistics. In the 1880s, indeed, when the new-style agricultural statistics were first collected, they were generally inefficient. 'There are men,' the director of land records wrote of the tehsildars in 1886, 'whose custom it has been never to leave their tehsils if they could possibly help it, and these men are very loath to change their habits and begin moving about actively. It is feared that such men, when they do go out, frequently do very little real inspection work; some from ignorance, others from idleness.' The kanungos were little better: there was the old hereditary kanungo, a man of ease and generally good social position, with a considerable amount of local knowledge which ... can be squeezed gently out of him, but as for hard daily work, it is not at all in his thoughts. He is altogether out of place in the new system, and is simply obstructive. We are getting rid of him. ... Then there is another kind of man, unacquainted with his work, and apparently appointed by mistake; or because he could ride or write a good hand. The director of settlements slays this man at once and rightly. ... The third class is the intelligent patwari appointed to act as a kanungo. This man knows his work and often tries to do it. Where he fails is in establishing his personal position of authority among men formerly his equals, and who, some of them, are nearly as good as he. He fails, too, sometimes in method, and is apt to keep too much to petty detail. ... The last class is that of men imported from settlement work direct. He is generally superior in knowledge and especially in style, added to which he comes with an air of authority. ... We want more men of this stamp.\(^{50}\)

The agricultural returns prepared under the supervision of these tehsildars and kanungos, and appended between 1866 and 1884 to the provincial government's annual administration reports, were 'little better than waste paper'—as the reports themselves disarmingly confessed.\(^{51}\)

In the 1880s the government of the Punjab embarked on a programme of reforms intended to improve the quality of the subordinate revenue staff, and so the quality of the agricultural statistics. There were few tenant rights to defend in the Punjab; it was a province of peasant proprietors. But it was hoped that 'a continuous record of agricultural fact' would simplify the process of resettling the land revenue, and show where the state could most effectively intervene to promote agricultural improvement. Conventional revenue settlements dispensed with accurate agricultural statistics; the new type of resettlement that the 'young Turks' of the 1880s wished to introduce depended on them. The theoretical (legal) standard of assessment—'half net assets'—was half the Ricardian rent of each holding: the value of the produce, minus the cost of production. This should have forced settlement officers to work out the value of the agricultural produce (the 'produce estimate'), which would have made accurate statistics of crop yields and areas indispensable. But assessments were based, in practice, on the
prevailing levels of cash rents. Only where cash rents were too rare to represent the ‘true letting’ value of land was the produce estimate taken seriously; even then it was based on data collected by the settlement officer for a few years during settlement, not on the continuous records of area and yield supposedly kept up by the patwaris, which were considered too unreliable. Nor was the produce estimate ever very accurate. Settlement officers were at pains to emphasize the ‘speculative’ nature of their own data. They were able—and this is the key to the revenue officers’ indifference to the agricultural statistics—to assess without an exact produce estimate. They could do this because, in the late nineteenth century Punjab, the pitch of the land revenue was low and falling. They had no need to work out the exact capacity of each estate to pay; they knew the jamas they intended to impose were sufficiently low to be easily paid. The only test of a settlement was how easily it worked: if it broke down it was obviously too high, if collections were made easily it was probably all right. Almost all the settlements made in the Punjab in the first fifteen years after annexation broke down. They were unrealistically pitched, and agricultural prices fell. The next official generation, determined not to repeat the same mistake, ran to the opposite extreme. Despite the protests of the Government of India at the sacrifice of revenue, late nineteenth-century Punjab settlements were pitched well below the true ‘half net assets’ standards and the effective pitch of the initial demand of each resettlement fell rapidly as agricultural prices rose and cultivation extended. It was this fall in the incidence of the land revenue that made it possible for settlement officers to assess on ‘general considerations’—increase in cultivation, population, prices, and trade—rather than an exact knowledge of agricultural conditions.52

It was not so much the subjectivity of resettlements, however, that provoked official disquiet as their cost. Large peripatetic settlement parties were necessary, which moved from district to district surveying the villages and bringing their records of rights up to date before the settlement officers finally assessed them. The state had to pay their salaries; and the villagers had to bribe them and feed them. Revision of the record of rights always precipitated a deluge of litigation; and the record, revised at such expense, rapidly became obsolescent when the patwaris neglected to maintain it. After plans to extend the permanent settlement to northern India were abandoned about 1870, Sir William Muir (then Lieutenant-Governor of the North-West Provinces) suggested a system of ‘self-regulating’ settlements intended to simplify and cheapen the process of resettlement. If, Muir argued, accurate records of rights and agricultural output could be kept up between settlements by the ordinary village patwaris, the revision of the
record of rights could be enormously truncated, and the new assessments could be 'automatically' calculated on the basis of the agricultural statistics already available in the village notebooks. This work, moreover, could be done by the village patwaris under the settlement officer's supervision.\textsuperscript{53}

The desire of other north Indian revenue officers—notably Sir Edward Buck—for a more positive agricultural development policy worked in the same direction, towards the maintenance of more accurate village records.\textsuperscript{54} The famine of 1877–79 radicalized official opinion, heightening the bureaucracy's receptivity to new proposals; and after the Famine Commission reported, a new Revenue and Agriculture Department was set up at the centre, and new Departments of Agriculture and Land Records in the provinces. The Government of India's continuing unwillingness to meet the cost of agricultural research and extension workers, however, compelled the new departments to concentrate on the introduction of 'self-regulating' settlements. The first of these new-style settlements broke down because of the patwaris' incompetence.\textsuperscript{55} They proved incapable of revising their own maps and records of rights; special settlement parties had to be sent to their rescue. It was not until the second round of resettlements, between twenty and thirty years later, that the improvement in the maintenance of the village records made it possible to rely on the regular patwaris to do much of the work of settlement, and utilize their crop inspections between settlements. This improvement, moreover, was far from uniform. It awaited the resettlement of each district. When the patwaris were required to survey their villages and correct their records of rights, as well as keeping their routine revenue accounts, a Darwinian selection of the fittest took place. The incompetent were exposed; and on average about half the patwaris in each district were dismissed. Despite the difficulties of recruitment, the new patwaris were on balance better educated and better trained. They enjoyed higher pay and better prospects of promotion; they were chosen less for hereditary connection and more for personal ability; and they were more closely supervised, making it possible to enforce the rules regarding residence and moneylending.\textsuperscript{56}

These changes were gradual, and to a certain extent they were ephemeral. Between settlements the patwari agency in each district relapsed. Only the perpetual vigilance of successive district officers could maintain a patwari establishment at the high point it reached under the settlement officer's regime; and few district officers could spare the time. Unlike the settlement officers, they had too many judicial cases to try, too many returns to complete, too many reports to write. 'With the ever-increasing burden of criminal and miscellaneous work', the Director of Land Records complained in 1913, 'the supervision of the
land records is becoming yearly less efficient. Collectors generally have not time for more than intelligent direction, but even this is not given in the majority of cases, chiefly owing to lack of knowledge and experience . . . 57 ‘No systematic check of land record work is undertaken by local officers on the plea of want of time, while government rejects the plea, but does not insist on any definite method or standard of check.’ 58 At the crucial intermediate level—the level of the kanungo and tehsildar—there was little change. ‘The land record work of tahsildars and naib-tahsildars’, the same director wrote, is . . . exceedingly perfunctory. They spend very little time away from headquarters, preferring to ride or drive out for a few hours, and then return . . . This is not in my opinion ‘camp’ within the meaning of . . . the Land Administration Manual; it wastes time and leads to superficial inspections, as the work has to be hurried through so that the officer may get back to headquarters . . . It is not, therefore, to be wondered at that the thorough scrutiny of every kanungo’s and patwari’s work prescribed by . . . the Land Administration Manual is never made . . . Tahsildar and naib-tahsildars . . . have time to camp and to perform their revenue duties properly but they do not care about land record work, and so they shirk it, knowing that their neglect of it will in most cases pass unnoticed by over-worked collectors and revenue assistants.59

Such was the situation on the eve of the First World War; thereafter it deteriorated. In the inter-war years the land revenue system ran down; and the agricultural statistics—or at least the inspections of crop areas—as an unimportant by-product of the system can hardly have avoided the general decline.60 There was no catastrophic breakdown; but the subordinate revenue officials became less disciplined. The first patwari strikes in the Punjab broke out after the First World War, when rapid inflation—outstripping belated increases in patwari salaries—coincided with the first non-cooperation movement. A decade later, at the height of the Red Shirt movement, control over the subordinate revenue agency in the North-West Frontier Province collapsed completely, and was only incompletely restored.61 The district officers had less incentive to maintain their efficiency. Land revenue lost its importance as the dominant source of government revenue; new forms of taxation like income tax or the high customs duties imposed after 1916 took its place. In the 1920s the Punjab Revenue Act reduced the maximum pitch of assessments to quarter net assets, and extended the normal duration of settlements to forty years.62 At the same time nationalist unrest and ‘nation-building activities’ distracted the bureaucracy; high flying careers were built on the successful handling of ‘political’ problems rather than efficient land revenue administration. The effect on the agricultural statistics was apparent to one of the last British settlement officers in the Punjab. ‘Lahore’, he wrote in 1943,
is a district in which the attention of the collector is continually distracted by urban and political affairs and the result is apparent in the work of the patwari and kanungo staff which is much below average. Between settlement tatiimna shijras were seldom correctly prepared and often not prepared at all, mutations were sometimes not entered for years on end, and the statistics in the notebooks were exceedingly unreliable. To put things right an experienced staff of tahsildars, naib tahsildars, and settlement kamingos was needed, but owing to the dearth of settlements in recent years, such men were not available.63

Crop Yields: The Impossible Average

Opinions as to the reliability of crop acreage figures might vary; but no one involved in the collection of yield statistics had much confidence in them. There were two series: the ‘normal yields’ of each major crop in each district, and the ‘seasonal condition factor’ by which the normal yield was multiplied to arrive at the out-turn of any given harvest. Supposedly firmly grounded in objective crop cutting experiments, both were in reality largely subjective estimates. The first statement of ‘normal yields’—submitted in 1892 in response to a requisition from the Secretary of State, who wanted information to answer questions in Parliament—was not based on any systematic scheme of crop cuttings. Yields were derived, instead, from a strange miscellany of sources. In temporarily-settled provinces the settlement officers’ estimates were adopted as the best available; in permanently-settled provinces like Bengal secretariat officials desperately raided old gazetteers and famine inquiries.64 Nothing, they discovered, was known of the yields of many crops in a large number of districts, and such data as they did discover had been collected in difference ways at different times, so that the reliance which could be placed upon it varied greatly. The key sources in Bihar were A. P. MacDonnell’s enquiry into the foodgrain supply, made after the famine of 1874–75, and the relevant volumes of Hunter’s contemporaneous Statistical Account of Bengal. MacDonnell had found the ‘question of average rates of produce ... one of the most perplexing with which I have had to deal. One maund, more or less, per acre may alter the complexion of a conclusion; may make a district look prosperous, while it really gives a bare sufficiency to its people; or make it look poverty-stricken, whilst it is in reality prosperous’.65 Hunter supplemented Buchanan Hamilton’s surveys—made in the early decades of the nineteenth century—with district officers’ estimates based on their subordinates’ general knowledge.

So haphazard information up to eighty years old was ‘adjusted’ according to the personal predilections of the individual official charged with filling up the Government of India’s table; and the striking characteristic of the resultant ‘mere approximations to truth’ is how long they survived unchanged. It was hoped they would soon be superseded
by the results of systematic crop cutting. But systematic crop cuttings never materialized. The earliest returns of crop cutting experiments were riddled with inexplicable discrepancies, and if these became less obvious over time, it was not because they became more reliable. Rather, the officials who collated them learnt what kind of result provoked enquiry or reprimand, and converted anything out of the ordinary into minor oscillations around conventional norms, which acquired authority through sheer repetition. In the province in which most care was taken with crop cutting:

There is uncommonly little system. There is a vast number of crop cuttings, the area of experimental plots and numberless other data varying at the will of [the] experimenter, who may be anyone from a mandal [village officer] upwards. No sort of accuracy is claimed for any of them.

In the Punjab:

Very great differences occurred in the estimates for land of identical quality and advantages situate in adjacent districts. For instance... well lands in Jhelum were estimated to yield 300 seers and lands of identical quality and advantages in Rawalpindi 400 seers.

In Bengal:

The data supplied by District Officers was [sic] so discrepant and manifestly untrustworthy that the attempts proved wholly fruitless. The statistics recently published by this department are mainly based on guesses, and although they may be useful in showing the relative importance of crop outturns, they cannot be depended upon in forming estimates of crop outturns. The system of crop cuttings has not yet been adapted to Bengal, and... even if the areas under different crops were accurately known... the mistake of a few seers in the outturn would lead to an error amounting to several million maunds for the whole province.

When the first quinquennial reports on crop cutting were submitted to the Government of India in 1898, the Imperial Revenue Department decided they could not be used to correct the original estimates of 'normal yield' made in 1892, because they were less reliable than the educated guesses of revenue officers on which the original estimates were largely based. Despite 'sifting' by provincial directors of land records, some blatantly implausible yields slipped through: the average yield of cotton per acre was 68 lb; the highest yield known in America, in the most favourable year on the most favourable soil, was 500 lb; yet Ajmer-Merwara reported an average yield of 908 lb. Such discrepancies cast doubt on the entire return.

The next quinquennial reports (for the quinquennium 1897–1902) met the same fate. 'A close examination of the present figures shows that they do not justify any general conclusions as to the yield of the
several crops,' the Director of Land Records for Bengal wrote in his annual report: ‘one officer returned 484 lbs. of cleaned cotton as the average yield and within a few months reduced it to 41 lbs.’ When the Punjab director actually altered some of the 1892 yields in the light of subsequent crop cutting, he was denounced by his successor, who compiled the next quinquennial return without reference to them. But the settlement officers’ estimates which he preferred were in turn denounced by the Lieutenant-Governor: ‘Every settlement report that I have seen has admittedly understated yields … The assumed yields should be raised by 25 or even 33 per cent.’ Later directors were similarly frustrated: ‘The wheat yield for 1926/7’, H. K. Trevaskis noted, ‘is based on the years 1917/18 to 1921/2. When … I recommended that the average should be taken of the five years immediately preceding the year under consideration … this proposal was rejected as too revolutionary. I am inclined to think it was too conservative and would have only given a fallacious appearance of accuracy to a system inherently vicious.’ The next set of quinquennial estimates (for 1927–32) led to an identical apology on yet another director’s part.

In Bihar, the directors of land records were content to let the original 1892 yields alone. They pursued a policy of ‘frightful candour’, returning even the most blatantly absurd results—the outturn of ‘irrigated sugar as 1,854 lb, the outturn of unirrigated sugar as 3,229 lb—with the caveat that no reliable data have yet been collected to justify any modification in the conclusions which were come to in the year 1892. I regret to say that the returns collected during the last year do not afford any reliable information and I cannot recommend their acceptance or any deductions being drawn from them.

In 1917 and again in 1920 the Bihar Director drew the Government of India’s attention to the ‘enormous variations in the yields reported as average and the absurd results obtained’; and when the Government of India petulantly inquired why the estimated provincial yield of winter rice (by far the most important crop) was so much higher than that returned for the most famous rice growing districts of the United Provinces or Bengal, he stopped all the crop cutting experiments. Five years later the provincial government discovered what the director had done: ‘I am not sure’, the provincial Revenue Secretary reassured his superiors, ‘that this has done any harm.’ The Government of India was not unduly disappointed when the next quinquennial report failed to arrive; officials inside the imperial secretariat were hardly bothering to discuss the crop cutting experiments’ unreliability. ‘As financial stringency has prevented adequate attention to crop cutting …’ the vice-chairman of the Imperial Council of Agricultural Research noted, ‘this department has no comments …’
The crop cutting experiments failed, in part, because their coverage was too limited. In the Punjab they were restricted to 14 out of a total of 30 districts, and to 10 staple crops—and not all 10 crops in each district. But at least the Punjab experiments formed parts of a coherent scheme: in Bengal the number of cuttings taken, the range of crops cut, and the manner in which the cuttings were made, all depended on the whim of the district officer and his subordinate officials. The real key to the experiments' failure was neglect. The district officers nominally responsible never appreciated the experiments' importance; never conducted experiments themselves; and rarely troubled to supervise their subordinates. Often they forwarded returns to the provincial secretariats without reading the tables they initialled. Even where they appreciated the experiments' importance, it was difficult to supervise them effectively. They could check the crop inspections easily enough; all they had to do was ride round the fields at any point between the girdawari and the harvest noting which crop had been sown in which field. But they had to be on the spot at the exact moment of the harvest if they were to check a crop cutting experiment, and few superior revenue officers felt strongly enough about the experiments to make the effort.

Left to themselves to select 'representative' plots, the subordinate revenue officials usually selected above average fields, made their cutting in the middle of the field instead of at the edges (where yields were lower), and harvested the crop with less wastage than the ordinary cultivator (who had to cut and process far larger areas in a limited time). 'They have a notion', the Settlement Manual remarked of the patwaris, 'that it is as well to make the entry which may be supposed to be most favourable to the interests of government.' Occasionally two cuts were taken—one where the crop was thinnest, one where the crop was thickest—but the average of the two was still too high. The distribution of yields in a rice field was such that in a field with a true mean of 15 maunds it might be possible to find 1/20 of an acre (the standard size of many cuts) yielding 40 maunds; it would obviously be impossible to find one with a yield of minus 10 maunds. 'The method', a Bihar settlement officer tartly remarked 'is not far different from attempting to estimate the average income of a population by taking half the sum of the incomes of the poorest man and the richest man in it.'

Punjab settlement officers in search of yield data for produce estimates explicitly rejected the inter-settlement crop experiments conducted by the district staff. 'No reliable experiments had been carried out prior to settlement' was the succinct verdict of M. M. L. Currie in Ferozepore in 1915. Thirty years later, in Gurgaon, the position was the same: 'experiments between settlements are meagre and unreliable'. In Bihar settlement officers simply made no mention of the
district staff’s experiments; they might as well have never been. Crop
cutting under the settlement officers’ supervision was better, but unless
the settlement officer harvested the crop himself
The results are untrustworthy. No native has the least idea of the necessity of
minute accuracy; so that if he really does cut down the crop, and does not make
simply a paper experiment, the result is sure to be vitiated by his inaccuracy.
It is, however, impossible for a European officer to do much in the way of
making experiments, especially for a settlement officer, who is constantly on the
move and cannot drag his crop around with him. He may be obliged to go to
inland tracts just when the river crops are fit to be cut. As regards some crops,
such as cotton, sugarcane, hemp and pepper, it is impossible to ascertain by
actual experiment what the outturn is unless one gives up weeks to the task.
And at the best, only a small portion of the field can be reaped; and it is very
unsafe to assume that the outturn of the whole field will be in proportion to
that of the small portion, let alone the outturn of a tahsil for a series of years.\textsuperscript{86}
Settlement officers’ subordinates, no less than the collectors, ‘like all
native government officers, felt it their duty to favour government by
selecting good crops on good land’. They tended ‘to look to the better
rather than the worse fields’; ‘to make insufficient allowance for dry-
age’; to ignore ‘fields which are planted . . . with paddy and bear no
crop at all . . .’.\textsuperscript{87} As a test of the success with which average fields were
really selected, a Punjab settlement officer conducted a series of maxi-
imum experiments in one year concurrently with the average experi-
ments. ‘It would only surprise a novice’, he concluded, ‘to find that the
outturns of the bumper fields were usually less than those of the
average crops.’\textsuperscript{88}
So the results of crop cutting experiments were too high. But too
high relative to what? The operative definition of the ‘normal’ yield
varied from time to time and place to place. The ‘mature’ official
definition did little to help: the normal yield was
That crop which past experience has shown to be the most generally recurring
crop in a series of years; the typical crop of the local area; the crop which the
cultivator has a right (as it were) to expect, and with which he is (or should be)
content, while if he gets more he has reason to rejoice, and if less he has reason
to complain; or in other words, it is the ‘figure which in existing circumstances
might be expected to be attained in the year if the rainfall and season were of
an ordinary character for the tract under consideration, that is, neither very
favourable nor the reverse.’ Briefly, it is stated to be the ‘average yield on
average soil in a year of average character.’ This normal or average yield will
not necessarily correspond with the average of a series of years figures, which is
an arithmetical average.\textsuperscript{89}
So vague and prolix a description not only confused subordinate offi-
cials, it led to endless controversy within the secretariats. Did this
‘soul-stirring and mouth-filling formula’\textsuperscript{90} signify mean or mode?
After twenty-five years there was still no agreement at the highest levels of the administration; while at village level

this standard is and must remain indefinite. The zamindar will inevitably treat the normal on the basis of expectation rather than experience; the normal is for him some crop such as was harvested in the golden age, which he has prayed for every year and seldom seen. This is his standard in ordinary times; where settlement is impending the normal becomes a meagre and unremunerative figure, reflecting the gloom which overtakes the countryside at the suggestion of encamped revenue.91

The 'most frequently recurring crop' was an abstraction difficult for anyone, peasant or subordinate official, to visualize: what they could understand was the actual crop, or the actual crop's relationship to a fully-matured crop: the crop they wanted to see.92

Whatever the 'normal' might be, settlement officers found it little easier than their Indian subordinates to select 'representative' plots which would give the normal yield. A tautology was involved: in order to discover what average yields were, settlement officers had to know what average yields would be, in order to select 'representative' plots. It was hard enough to judge the outturn of a single field; it was well nigh impossible to estimate the average outturn of areas as large and diverse as a tehsil or a subdivision, when districts were the size of English shires.93 Harvests fluctuated wildly: in Muzaffargarh 'there are no true averages, and nature works by extremes, so that there is no standard of outturns, either from year to year or from estate to estate.'94

In the diara of Bihar—tracts annually submerged beneath the rising rivers, which left behind a deposit of fertilizing silt one year, and barren sand the next—bumper harvests alternated with total failure.95 When 'the produce of former years...is just what we do not know', it was difficult to relate the results of a single season's crop cutting to longer-term averages.96 The range of soil fertility was wide: in Hazara 'even within the limits of the assessment circle the soils vary so widely from the best to the worst, such estimates, however numerous and careful the crop experiments, must be very largely guess work'.97 There were no soil surveys to show the area of each soil, which would have made it possible to weigh the results of individual experiments: so that when experiments on wheat in one small assessment circle gave yields varying from 26.4 to 640 lb per acre, and the probable area under each yield was unknown, striking a meaningful average became impossible.98

There were no figures, either, to show the extent of the different varieties of the same crop, although the highest-yielding rices gave many times the yield of the poorest.99 Nor was the exact significance of areas recorded as double-cropped clear: sometimes it meant paddy followed by a full crop, sometimes it meant paddy followed by a scratch
crop. Sir John Hubback concluded, "is comparable to estimating the average income of the population of a town by watching the streets for a few days, and then picking out a man, who looked to be in average circumstances and discovering what his income is." Disenchanted with crop cutting experiments, settlement officers sought additional evidence of yields in the opinions of local cultivators, the accounts of landlords realizing rents in kind, and—above all—the yields assumed in previous settlements. Each source had defects of its own. "It is utterly useless enquiring from the people," W. E. Purser exclaimed, "they reply with the most barefaced and self-evident falsehoods. Now and then a man may be entrapped into a damaging confession, or a simple-minded cultivator may blurt out the truth; but such cases are rare." The peasants of Bihar were no better: "the statements of the people themselves are of course absolutely untrustworthy." Few settlement officers were quite so cynical: but both landlords and tenants had ends to serve. Tenants afraid that their rents would be enhanced or commuted had good reason to understate yields: so had landlords afraid that the land revenue (or the cesses they paid in permanently-settled provinces) would be increased. Landlords whose kind rents were about to be commuted or reduced had a powerful incentive to overstate yields. In any event, they found it difficult to give reliable answers. The tenants kept no records; the landlords' records were manipulated by his employees, anxious to conceal their own systematic peculation. Comprehending a measure of area, much less a 'normal' yield, posed problems. "They could tell me", a Kulu settlement officer wrote, "how many measures of grain they expected from a measure of seed, and also what measure of seed of each kind was required for the ground that produced a given measure of barley"—but not the area of the ground. Settlement officers, accordingly, relied heavily on the yields assumed in previous settlements. MacDonnell remained a favourite quarry in Bihar; in the Punjab a settlement officer explained in 1929, with no sense of the irony involved, "The majority of these yields have come down unchanged since the first regular settlement (1870–78), and have stood the test of experience." These yields were not only highly conservative; they were also far lower than the results of the crop experiments; lower even than the settlement officers believed the true average to be. Concerned to minimize the possibility of accumulating arrears of unrealizable land revenue, to restrict rent enhancements, and to ensure that famines were relieved in time, they preferred to 'err on the safe side'—the phrase runs through the entire settlement literature—by understating outturn. The ordinary settlement officer may not have worked out his yields by guessing 'at that average . . . which he
thinks is least likely to provoke the criticism of the financial commissioner's clerks, who may never have seen a wheat field in their lives',

but he did undoubtedly adjust his yields to fit the assessments he wished to impose. 'A system', the Punjab government decided, 'under which the assessment rates are first devised and the assumed outturns are subsequently determined is open to considerable criticism from a theoretical point of view; but in consideration of the uncertainty of our outturn estimates and the rough manner in which they must be utilised in fluctuating assessments' the procedure was approved.

Both sources of data on crop yields—the regular experiments undertaken by the district staff (which were too high, and tried to cover entire provinces superficially) and the yields assumed by the settlement officers (which were too low, and dealt with individual districts at thirty-year intervals)—were fed into the machine that ultimately regurgitated the impressively bound volumes of agricultural statistics. Exactly what happened to them there is difficult to determine. As always, they were never processed in a uniform way. The tehsildars at tehsil level, the sub-deputy collectors at subdivisional level, the deputy commissioners and collectors at district level, the directors of land records and agriculture at provincial level, all 'adjusted' the data they received from their subordinates in an attempt to arrive at averages for ever-larger territorial units. These adjustments were not statistically sophisticated. To calculate a mode or a weighted average 'would require a statistical agility which is far beyond any tahsildar, and in practice the tahsildar estimates in maunds per acre what he thinks is a reasonable amount... The fallacy underlying this procedure lies in the assumption that the term "average yield per district" has any meaning at all.'

Some directors used the routine crop cutting results; others preferred the settlement officers' assumptions; frequently estimates of normal yields were amalgams of the two. The specific decisions were based on no consistent principle, except perhaps the belief that if only a large enough number of estimates was averaged out, however wide of the mark individual estimates might be, the result would turn out to be the right yield, because estimates which were too high would cancel out figures that were too low. A secretariat official exposed this fallacy: 'Put crudely, it amounts to this: that while \(0 \times 1 = 0\), \(0 \times 1000 = 950\). If very little reliance can be placed upon an individual experiment, the fact that it is repeated a thousand times does not make it any more trustworthy.'

The seasonal condition factors by which these normal yields were multiplied to arrive at the outturn of any given harvest were, in origin, estimates made by the Punjab patwaris and the Bihar circle or subdivisional officers. They were called upon to appraise the harvest at so
many annas in the rupee, taking a ‘normal’ harvest as 12 annas. In theory the crop could be appraised to within one anna (3–4 per cent), but subordinate officials tended to think in terms of much larger units. Estimates grouped themselves around the 0, 4, 8 and 12 anna marks: so that the maximum margin of error due to the size of the reporting units alone could be over 12 per cent. A further source of error was the patwari’s alleged pessimism. ‘The figure given in the final forecasts for the district’, one settlement officer warned, ‘is most unsafe as a guide. The average figure ... for the years 1900–1910 is no where higher than 79%. It should of course be nearly if not quite 100.’ But testimony on this point conflicts. Other authorities suggest that patwaris underreported areas of failure to save themselves trouble and that their superiors in both the revenue and irrigation departments minimized failures in case they reflected on their mismanagement of the tract concerned. Probably deliberate bias was less important than the sheer difficulty of relating a given harvest to a hypothetical ‘normal’. Bowley and Robertson’s considered judgement was that patwaris tended to report (i) no change from the previous year, or (ii) an average crop, when the yield is moderate, (iii) to underestimate a good crop, and (iv) to exaggerate the fall in the case of a bad crop. This is as near the mark as we are likely to get.

The estimates of seasonal condition were then subject to the same errors of statistical method as the crop cutting experiments. ‘In the Indian procedure’, Bowley and Robertson acidly observed, ‘the detailed arithmetical methods that would give more accurate results are almost deliberately avoided.’ Some of the patwaris’ and the chaukidars’ superiors worked out arithmetic averages of their returns; some chose the figure that occurred most often; a few tried to weight the figures by the areas to which they ostensibly related; many ignored the returns altogether and reported a number on their own judgement. ‘All that is done’, Hubback wrote of Bihar, is for the local police officers to make a guess, at which in succession the subdivisional officer, the district officer and the director of agriculture guess again. When it is considered that the percentage depends ultimately on the effect of the weather on very various soils, cultivated with varying degrees of skill and enterprise, planted with different kinds of rice, protected by irrigation works of greater or less efficiency or completely unprotected, liable to or immune from crop pests, and finally harvested over a period of nearly three months, it becomes apparent that the guessing ability of the officers concerned has to be remarkable. Unfortunately, too, not one of them has the least chance of finding out whether his guess was fairly right or wildly wrong. Hence the existing statistics of rice production are, I believe, the result of applying to a fairly accurate figure of area an arbitrary standard of normal yield, and a pure guess of the condition of the year.
Dissatisfaction with the ‘normal yield times seasonal condition’ formula led to its supersession in the Punjab in the 1920s by direct estimates of outturn, as so many maunds per acre each harvest. ‘Great discrepancies’, however, were soon discovered between the direct estimates of ‘experienced agricultural officers … and it is hopeless to expect anything better from the ordinary untrained reporting agency’. Experiments conducted by the Imperial Council of Agricultural Research to check the accuracy of direct estimation were not reassuring:

Cultivators, whether owners of the crop or their neighbours, consistently over-estimated yield in trying to forecast it from the standing crop, the difference being that the neighbours’ forecast was generally higher than that of the owners. The agricultural staff placed the yield at a higher level still. … Forecasting by the field staff of the [ICAR sample survey] was slightly better than that of the agricultural assistants, being probably more carefully made. … [But] the various correlation coefficients [were] of the same order. This correlation is not high enough to make these forecasts very accurate.119

The influence of the old ‘normal yields’ persisted in the new direct estimates of each harvest, ‘as every official who is concerned with the preparation of forecasts is aware of what the normal is’.120

The direct estimates made by the subordinate staff of the revenue and agriculture departments were processed in the same way as the seasonal condition factors.121 In the district (Lyallpur) investigated by the ICAR scheme, the tehsildars arrived at their tehsil averages ‘on the basis of general impressions and information gained by [themselves] and [their] staff’; while the deputy commissioners adjusted about half their figures, generally upwards, sending on the rest of the tehsil figures unchanged. Adjustments of 30–40 per cent were common; changes of 60–70 per cent were not unknown. In calculating the district outturn, the tehsil estimates were simply added together: if a weighted average (for the area of each tehsil) had been taken, the district out-turn would have been 10 per cent lower. The agricultural assistants in the tehsils sent their estimates to extra assistant directors of agriculture, who worked out the district production as a simple average. The fact that the agricultural assistants’ original estimates were not revised upwards brought the two departmental series closer together: the tehsildars’ original estimates being almost always lower than the agricultural assistants’. At the provincial level the director of agriculture compromised between the two sets of data, with a slight bias towards his own subordinates. The actual compromises ‘were based on no consistent principle’.

Dissatisfaction with the ‘normal yield times seasonal condition factor’ in Bihar led to a methodological breakthrough which ultimately revolutionized the quality of Indian agricultural statistics. The technique of random sampling produced objective output data: and ‘the earliest
crop cutting experiments based on the principle of random sampling anywhere in the world' were undertaken by the Director of Land Records, Bihar, in 1923–24. Sir John Hubback's greatest contribution to the science of statistics was his pioneer work on the method of calculating the margins of error to which random samples were subject, and his application of that method to the problem of working out the expenditure required to attain a desired degree of accuracy, or, conversely, the degree of accuracy likely to be attained for a given expenditure. His combination of theoretical originality and administrative ingenuity also resulted in a host of solutions for more practical problems—such as the selection of plots on the ground, the mechanics of cutting, the prevention of fudging.

Hubback's official superiors were slow to realize the full potential of his experimental surveys. 'His language and technique are completely beyond me', the revenue member of the government of Bihar confessed; they were even 'far over' the Governor's elevated head. Commentatory letters from eminent British statisticians persuaded the secretariat to trust Hubback's judgement of matters beyond their comprehension, and the usual reluctance to spend money on statistics with no obvious utility was overcome when Hubback promised to conduct his surveys without employing additional staff; but his promotion to higher things and the financial crisis of the 1930s put an end to random sampling in Bihar. Two settlement officers in the Central Provinces alone adopted Hubback's approach, until the collapse of primary produce prices revived interest in accurate agricultural statistics as a basis for restricting crop production. Export crops such as jute suffered most from the depression; and they had well-organized trade associations, able to urge the case for restriction on Indian administrators. India had a natural monopoly of jute production; it seemed certain that the restriction of production must drive the world jute price up; and millions of cultivators in Bengal and Bihar depended on the jute crop to meet commitments payable in cash. So in 1935 the Bengal Department of Agriculture tried to organize a sample survey of the jute crop in selected thanas—which showed just how easy it was to make a complete mess of a random sample survey. The Director of Agriculture was too busy to solve the innumerable unforeseen difficulties which constantly arose: the Finance Department slashed the original budget allocation; the staff of investigators was badly trained, supervised, and organized. The following year the government of Bihar sanctioned a plot to plot survey of the jute crop in the one important jute growing district of Bihar, Purnea. Although the ordinary jute acreages were collected through a special system of growers' panchayats under the supervision of a small inspectorate, which meant they were more
accurate than the area statistics of any other crop, the 1936 survey revealed such appalling inaccuracies in the ordinary jute statistics as finally to shatter the government of Bihar’s confidence in its own returns. The first regular forecast of the jute crop for 1936 was 200,000 acres; the survey showed jute crops covering 453,000 acres. ‘It was known’, the Bihar revenue secretary expostulated, that the estimates based on the reports of chaukidars were very inaccurate, but it seems almost inconceivable that there should be such enormous miscalculations. In [one] police station the figure according to the police report is only one-third of that found in the survey. In [another] the police report [gives] 172,600 acres ... and ... the survey 6385... 128

So—despite the initial failure in Bengal—the Indian Central Jute Committee decided to persevere with random sampling. Professor P. C. Mahalanobis accepted their commission and his triumphant organization of the 1938 jute survey of Bengal finally established the technique of random sampling in India. He faced obstacles similar to those faced by Hubback: incomprehension in the secretariat; financial stringency; local officials too busy to do more than display ‘sympathetic interest’. 129 He also confronted new problems of scale. He had to organize—recruit, train, control—a huge staff of poorly-paid temporary investigators scattered over a vast province, often in inaccessible tracts. And he had to resolve theoretical difficulties, in both the planning and the computational stages, for which he was elected a Fellow of the Royal Society. 130 Not all of Mahalanobis’ methods have stood the test of time: the ICAR sample surveys of the wheat and rice crops which were initiated during the Second World War ‘Grow More Food Campaign’ and gradually spread over the whole of India, bar Bengal, used the regular district or revenue staff to take samples, instead of Mahalanobis’ special teams of investigators. 131 But the fact that the ICAR surveys were undertaken at all was a tribute to the immense superiority of Mahalanobis’ results, compared with the agricultural statistics of the past.

MARGINS OF ERROR

We can never know the exact margins by which the official agricultural statistics erred. We could do so only if we knew exactly what agricultural outturn was; and alternative sources of data, more reliable than the official statistics, only become available—for a few crops, over limited areas—after 1933. Any very general adjustment based on supposed biases in the system of collection founder on the fact that the most notorious biases (optimistic crop cuttings, pessimistic seasonal condition factors, incomplete crop inspections, and incomplete reports of failure) counteract each other; and the net bias could only be calculated if the exact degree of each individual bias was known, which
in many cases it cannot be. Contemporaries occasionally appeared to accept a few poorly-substantiated generalizations about net bias. In the Punjab it was often claimed that outturns were understated by 25–33 per cent: this being the margin it was believed that the great export houses added to the official estimates as a basis on which to arrange their forward dealings. But there was no great confidence in this figure. Generalized scepticism about the reliability of the statistics was more common. ‘The yield of wheat in the Punjab in 1920’, the Director of Agriculture confessed, ‘may have been four million or five million tons, or some other figure. How are we to find out?’

Each time the government genuinely tried to find out, the attempt failed. After the famines of 1896–99 the Government of India tried to obtain provincial figures for per capita food production and consumption. The Punjab government duly sent in returns which it candidly explained were underestimates. ‘Really close approximation [to reality]’, they reassured the Government of India, ‘is impossible, except by lucky accident, to attain in an enquiry which must necessarily be guided by hypothetical considerations often of dubious reliability, and in which the smallest variation in the assumptions makes a final difference of thousands of maunds.’ Returns from other provinces were worse; some displaying inconsistencies ‘little short of grotesque’. Both the Government of India and the India Office agreed that the results were too unreliable to be published. A decade later, attempts to calculate the wheat surplus in the Punjab available for export to a war-torn Britain foundered on the unreliability of the official figures for outturn. In 1934 Bowley and Robertson wished to include the agricultural statistics in a census of production, only to conclude reluctantly that they were useless for any purpose except warning the government of imminent famine. In particular, they were useless for working out ‘whether or not food is increasing in proportion to population’. Ten years later, as the Bengal famine showed, they were unfit even to warn the government of the advent of famine; and when food rationing was introduced, food controllers complained bitterly of their inadequacy as a basis for food planning. When rice prices began to rise in 1942, there were no reliable statistics of the production, consumption, or stock of the most important commodity in Bengal:

The official estimates clearly indicated a large deficit; and yet we know that the position was not considered serious by Government. The official estimates were evidently disbelieved by the very Government which issued them. . . . It was quite impossible to judge to what extent the present crisis was due (a) to actual physical shortage of rice or (b) to failure of distribution arising from the withholding of the marketable surplus by hoarding and/or profiteering. Appropriate administrative measures could only have been taken on a correct
appreciation of the relative magnitude of shortage and hoarding. In the absence of reliable statistics both official and non-official opinion oscillated violently from time to time between the two alternative hypotheses.\textsuperscript{138}

If the full resources of the Indian state found it impossible to arrive at reliable figures for agricultural production or consumption for a single year, it seems inherently improbable that latter day economic historians should be able to calculate precisely-calibrated trend-rates over fifty-year periods.

Comparisons between the official statistics and the independent data available after 1933 are interesting, if not particularly enlightening, because the divergences are so diverse. They fall into few consistent patterns; rather they confirm the random quality of the official statistics. The independent data is of three kinds. In 1933 the Indian Central Cotton Committee initiated an attempt to check the accuracy of the all-India cotton forecasts by working out the consumption of cotton. Ten years later, in the aftermath of the Bengal famine, the government of Bengal recruited a special task force of crop recorders, 30,000-strong, to undertake a complete ‘plot to plot enumeration’ of the province. And from 1943 onwards we have the results of the sample surveys of major foodgrains conducted by Mahalanobis in Bengal, and elsewhere by ICAR.

The Indian Central Cotton Committee’s attempt to calculate the consumption of cotton rested on accurate data for net exports and full information on mill consumption, but incomplete data for stocks and a conventional estimate of some 250,000 bales for village retention.\textsuperscript{139} Subsequent enquiries into consumption by a million and a quarter villagers showed this conventional figure surprisingly accurate. Although per capita village consumption varied widely—from 3·832 lb in the Punjab to 0·162 lb in the Central Provinces (a suspiciously low figure)—the all-India average of 0·9798 lb closely approximated the 1 lb per capita figure on which the 250,000 bales estimated was based.\textsuperscript{140} Total consumption, calculated on this basis, exceeded the official figures for cotton production (between 1934/35 and 1936/37) by 11–16 per cent. The discrepancies in the Punjab (where the level of village retention was the highest in India, and the expansion of cotton production was most rapid) were so great that the Department of Agriculture was asked to re-examine its yields. This provincial post mortem showed that while the official statistics stated production was 4·63 maunds an acre, 4·65 maunds an acre were annually ginned and pressed in the cotton mills—without any allowance for village retention.\textsuperscript{141} If allowance were made, consumption rose to 5·95 maunds an acre; which showed the official yields to be 28·5 per cent too low. In the following quinquennium (1932–37) consumption rose to 7·66 maunds, and the
degree of official underestimation rose with it, roughly approximating the 33 per cent allowance made by cotton dealers.

The plot to plot enumeration of Bengal in 1944–45 exposed a parallel understatement of crop areas by the official returns: 20.7 million acres of paddy against the Director of Agriculture’s five year average (1937–1941) of 15.6 million; and a total cropped area of 38.6 million acres against the Director of Agriculture’s 29.5 million. Unfortunately no direct comparison with the official figures for 1944/45 is possible, because they were never published, and official acreage figures after 1941 were drastically revised upwards. This is why the development commissioner responsible for the enumeration chose to compare his results with the official average for 1937–41; it gives a far better idea of the traditional degree of underestimation in the Bengal figures. Of course, the plot to plot enumeration itself was far from perfect. The primary reporters—the 24,000 crop reporters—were essentially patwari substitutes, paid only Rs 100 per annum and conscious that the job was only temporary. They had to be recruited, trained, and organized in a matter of months, and the basic records on which the accuracy of their inspections depended—the mauzawari list of plots and their areas—were often out of date. But the sole function of this huge establishment—unlike the patwaris—was the collection of accurate agricultural statistics. The 24,000 crop reporters were chosen from 50,000 candidates according to their conduct of trial inspections; they were trained in 1,000 training camps; and a large proportion of their returns (over 25 per cent) was checked by their official superiors. An independent check by the Department of Agriculture (irritated when its own statistics were shown to be so misleading) revealed errors of only 0.04 per cent in the enumeration of the paddy area and 0.28 per cent for total cultivated area in 14 villages chosen at random.

The plot to plot enumeration, however, failed to provide reliable data on yields. 60,000 crop cuttings were taken; but they were subject to all the traditional limitations. The majority, moreover, were taken ‘at a time when the staff had become extremely restless and nervous in consequence of the recommendations of the Rowland Committee [that their employer, the development department, be retrenched], and it is not possible in every case to guarantee a high standard of work’. It was random sampling that made a reality of the mythical ‘average yield’. Mahalanobis’ pioneer jute survey, sadly, tells us little about the regular agricultural statistics because data on jute output were collected through a unique system of growers’ panchayats. His subsequent rice surveys of Bengal and two districts of Bihar are comparable. In Bengal in 1944/45 he apparently arrived at an acreage of 22.2 million, compared with the plot to plot enumeration’s 20.9 million and
the Director of Agriculture’s 15.6 million five year average. In the two Bihar districts the official figure for the total cultivated area (in 1943/44) was 1.283 million acres; Mahalanobis’ was 1.423 millions: an official underestimate of 10 per cent. But Mahalanobis also discovered that official yields in Bihar were so high that the official outturns were in fact inflated. This is difficult to reconcile with the ICAR survey, which showed that wheat outturn in Bihar was 20.4 per cent understated in 1945/46, but the figures are not directly comparable and it seems pointless to speculate on their divergence. The margins of error revealed by the ICAR surveys are shown in Table 17.1.

Table 17.1. Percentage Over or Underestimation of the Official Estimates of Foodgrain Output and Yields compared with the ICAR Sample Survey, 1945/46–1948/49

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<tbody>
<tr>
<td>Bihar</td>
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<td>-30.7</td>
<td>-34.5</td>
<td>-37.9</td>
<td>-10</td>
</tr>
<tr>
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<td>-4.5</td>
<td>+4.8</td>
<td>-7.2</td>
<td>-3</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
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<td>-20.0</td>
<td>-7.9</td>
<td>-9.5</td>
<td>-11</td>
</tr>
<tr>
<td>Madras</td>
<td>n.a.</td>
<td>+12.6</td>
<td>-4.1</td>
<td>-0.2</td>
<td>0</td>
</tr>
<tr>
<td>Orissa</td>
<td>-21.4</td>
<td>-11.1</td>
<td>-18.2</td>
<td>n.a.</td>
<td>-19</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>+10.4</td>
<td>+7.3</td>
<td>+0.9</td>
<td>+2.8</td>
<td>0</td>
</tr>
<tr>
<td>Total*</td>
<td>-14.4</td>
<td>-8.0</td>
<td>-12.7</td>
<td>-9.5</td>
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*Includes Assam (1947/48–1948/49) and Coorg (1946/47–1948/49)

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<td>-18.7</td>
<td>-4.3</td>
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</tr>
<tr>
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<td>+34.7</td>
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<tr>
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<td>-22.2</td>
<td>+2.4</td>
<td>-6.6</td>
<td>-3</td>
</tr>
<tr>
<td>Punjab</td>
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<td>+16.5</td>
<td>-5.2</td>
<td>-8.2</td>
<td>-10</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
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<td>+1.8</td>
<td>+13.0</td>
<td>+9.5</td>
<td>+7</td>
</tr>
<tr>
<td>Total*</td>
<td>-8.7</td>
<td>+0.2</td>
<td>+5.2</td>
<td>+2.4</td>
<td></td>
</tr>
</tbody>
</table>

*Includes Ajmer-Merwara and Delhi (1946/47–1948/49)


As might have been prophesied, the margins of error in the official statistics for the permanently settled provinces were high: an understatement of approximately 34 per cent in the paddy acreage of Bengal (according to the plot to plot enumeration) or 42 per cent (according to Mahalanobis’ survey); an overstatement of the wheat yield in two districts of Bihar of 28 per cent and 43 per cent (according to Mahalanobis), an understatement of the rice outturn in Bihar of 30–38 per cent.
(according to the ICAR survey). The margins of error in the temporarily-settled provinces are smaller. This is especially true of the United Provinces. But it should be remembered that the ICAR survey, which shows these small margins of error, understates the margins of error in two significant ways. In the first place, the data for an area was not always obtained through random sampling; it was also collected in temporarily-settled areas through the patwaris. So errors regarding crop areas in the official statistics may be replicated in the ICAR data. Secondly, as the ordinary district establishment was employed to conduct the ICAR survey (the great difference between the surveys in temporarily and permanently settled provinces), it may well be that the ordinary official statistics were altered to reduce the differences between them and the ICAR figures, just as acreage figures in Bengal were revised upwards after 1940-41. It is quite inconceivable that regular crop cutting experiments should arrive at exactly the same yields as random sampling on rice in Madras or the United Provinces.

The comparisons make possible some rough corrections of the official statistics. Bengal rice areas have to be raised; Bihar yields may or may not have to be lowered. But such corrections can only be made in a limited number of cases, on an ad hoc basis. There can be no across the board levelling up or levelling down. After admitting that ‘there appears to be little basis for choosing between [the] possibilities of how the error might have been distributed over time’, Blyn chose the likelihood that ‘there was some improvement in the accuracy of the estimates’ as the most probable; K. Mukerji, with equal plausibility, affirmed that the system’s inherent conservatism and the deliberate reduction of normal yields found to have been pitched too high led to progressive under-enumeration. Even if we could be certain that the biases apparent in the 1940s bore a known relationship to the errors obtaining in the 1890s, which we cannot, the biases of the 1940s fall into few consistent patterns.

CONCLUSION

There were good reasons why output statistics in India should be unreliable and incomplete. Official enquiries—by the Board of Agriculture in India (1919), the Indian Economic Enquiry Committee (1925), the Royal Commission on Agriculture in India (1929), Professor Bowley and Dr Robertson (1934)—stressed the ‘vacuum at the centre’: the absence of statistical bureaux in the secretariats capable of continuously monitoring incoming statistics, defining their inadequacies, and supervising the introduction of improvements. So long as the state made no attempt to ‘plan’ the economy, generalist officials went on collecting statistics as by-products of regular administrative routines at minimal
cost. They achieved some remarkable, even astonishing, results: not least the decennial census. But as soon as the state needed reliable output data as a basis for economic controls, an expert statistical establishment became inevitable.

The earliest attempts to create such a statistical establishment ran up against the same kind of laissez-faire opposition as the first essays in planning—and to some extent the more conservative officials’ opposition was warranted by circumstances. Low grade Indian statistics were not just a question of poor organization at the centre. They were also a function of India’s poverty. A myriad good causes pressed on the slender resources of the state. The great majority of producers were illiterate and incapable of appreciating the significance of a statistical return. In a backward economy units of production were small, predominantly rural, and dispersed over a huge area; subsistence production complicated the problem of measurement and evaluation; there were few trade or professional associations to act as intermediaries. India’s vast size and population—the sheer number of units to be enumerated—was a problem in itself: especially when the diversity of conditions made uniform arrangements impossible.

For all these reasons, the system through which the Indian agricultural statistics were collected was far more unstable and diverse than the bland prefaces to the published volumes of statistics—with their stereotyped descriptions of uniform procedures rarely operative in practice—would lead one to suppose. It varied from province to province, district to district, even from official to official; and it changed, also, over time. It contained elements of negligence and incompetence, of subjectivity and conservativism, of corruption and absurdity. And in retrospect it seems impossible to reconstruct the system’s vagaries—its advances towards reality and retreats towards convention—in sufficient detail or with sufficient certainty to correct their conflicting biases. Perhaps the only valid generalization about the net margin of error is that the system was inherently conservative. Official indifference and genuine perplexity stereotyped yields, in particular, at levels ‘which had no basis in observed reality’. It was because the system was too sluggish to respond to the sowing of improved seeds that Bowley and Robertson—the most distinguished English statisticians to examine the Indian statistics—believed it ‘impossible to ascertain whether the quantity of food produced is keeping pace with the population’. This was the opinion, also, of the most distinguished Indian statisticians to consider the problem, Sir John Hubback and P. C. Mahalanobis. We simply cannot know, with anything like the accuracy or the authority Blyn implicitly assumes, how rapidly Indian agriculture expanded.

But to say this is far from saying that the agricultural statistics are
useless. They may provide poor answers for the development economists' questions about national growth rates; they may have an unhappy knack of converting the unwitting econometrician's calculations into elaborate sophistries; but they remain an inexhaustible repository of evidence for the historian of Indian agriculture. Even if the unreliability of the data on yields makes it impractical to construct reliable fifty-year trend rates for every crop in every province, the figures for crop acreage in the temporarily-settled areas are still hard enough to show changes in cropping patterns which are invaluable evidence of farmers' response to price movements, to irrigation, to railways, to different tenurial systems, to the whole range of factors affecting Indian agriculture. Provided they are examined (as statistics should always be examined) in conjunction with the system through which they were collected, the official data—with suitable modifications, and suitable reservations—can still reveal the most rapidly developing and the most disastrously deteriorating agricultural regions; the first step towards any historical analysis of the determinants of growth and decline. Disaggregation, here, will be the key; large aggregates conceal too much. All-India averages combine opposing trends—catastrophic deterioration in Bihar with rapid expansion in the Punjab—to give an impression of general stagnation; the averages of super-provinces blend the performances of heterogeneous farming types. The future lies with detailed studies of the agricultural statistics of quite small areas, which can add a quantitative dimension to intensive qualitative studies of the history of distinct farming types and regions. The agricultural statistics of India can be either a butcher's cleaver or a surgeon's scalpel in our hands; and if we choose to use them as a cleaver, we cannot expect comparable precision in the results.
Abbreviations

Ag    Agriculture Branch
Ag Stats Head Agricultural Statistics
BIR   Government of Bengal, Revenue Proceedings
BrLR  Government of Bihar (and Orissa), Land Revenue Proceedings
BrR   Government of Bihar (and Orissa), Revenue Proceedings
BrSCRO Bihar State Central Record Office, Patna
EHL   Government of India, Education Health and Lands Proceedings
ICAR  Imperial Council of Agricultural Research
IESHR Indian Economic and Social History Review
IORDP India Office Revenue Departmental Papers
IR    Government of India, Revenue Proceedings
JRSS  Journal of the Royal Statistical Society
KW    Keep-with
NAI   National Archives of India, New Delhi
PBOR  Archives of the Punjab Board of Revenue, Lahore
PGRF  Punjab Government, Revenue File
PLAM  J. M. Douie, Punjab Land Administration Manual (Lahore, 1908)
PLRecR Annual Report of the Director of Land Records, Punjab
R     Revenue Branch
Stat  Statistics Branch
SR    Settlement Report
WBSA  West Bengal State Archives, Calcutta

(The research on which this paper is based was made possible by grants from the Nuffield Foundation and the Social Science Research Council.)

1. The agricultural statistics to which this paper refers are those contained in the Reports on the Administration of the Punjab (1866–84); the Reports on the Agricultural Statistics of the Punjab (1884–87), Bengal (1891–1911), and Bihar (1911–47); the Reports on the Season and Crops of the Punjab (1901–47), Bengal (1901–11) and Bihar (1911–47); the Quinquennial Reports on Crop-Cutting Experiments in Bengal (1897–1912); and the relevant provincial sections of the Agricultural Statistics of India (1884–1947), the Estimates of Area and Yield of Certain Principal Crops (1891–1947), and the Average Yield Per Acre of the Principal Crops in India (1892–1947).

2. Government of India (hereafter GOI), Commerce Department, Commerce Branch, file 7-C(12)/36, H. Dow note, 28 September 1934, National Archives of India (hereafter NAI). Cf. G. A. D. Stuart (Director of Agriculture, Madras), 'The Seasonal Factor in Crop Statistics: A Method of Correcting for the Inherent Pessimism of the Farmer', Agricultural Journal of India, xiv (1919), p.275: 'A knowledge of the state of the season is not so important as an appreciation of the psychology of the village accountant and the taluk clerk, and an estimate of the state of departmental discipline of particular districts. A taluk was found recently where no village accountants kept any accounts, and where all figures were invented at the close of the year.'


4. E.g., S. Sivasubramaniam, 'Estimates of the Gross Value of Agricultural Output in Undivided India, 1900/1 to 1946/7', in V. K. R. V. Rao et al. (eds), Papers on National Income and Allied Topics (London, 1960); K. M. Mukerji,


8. The North-West Frontier Province was carved out of the Punjab in 1901, and the imperial territory of Delhi in 1912; hence the references to Delhi and to Districts subsequently included in the NWFP.

9. Until 1912 Bihar was part of Bengal; from 1912 to 1936 it was part of the province of Bihar and Orissa; from 1936 it was a separate province in its own right. Hence the references to ‘Bengal’ before 1912; between 1912 and 1936 I have abbreviated ‘Bihar and Orissa’ to ‘Bihar’.


11. The descriptions of *patwari* and *chaudidar* are based upon the annual *Reports of the Department of Land Records and Agriculture, Punjab* (1891–1905); the *Reports on the Operations of the Department of Land Records, Punjab* (1905–45); the relevant Punjab Government Revenue files (hereafter PCRF) in the archives of the Punjab Board of Revenue, Lahore (hereafter PBOR); the reports on the settlement of districts in the Punjab and Bihar (hereafter SR); the *Reports of the Director of Land Records, Bengal* (1893–1908); the *Reports on the Agricultural Department, Bengal* (1885–1912); and the *Reports on the Administration of the Police, Bengal* (1880–1912). There is some doubt as to the exact role of the *chaudidar*. In his PhD thesis (op. cit., pp.35–7) Dr Islam points out that there are no references to the collection of agricultural statistics in the *Chaudidari Manual* (Calcutta, 1916) and no references to *chaudidars* in the *Manual for the Preparation of Crop Reports and Agricultural Statistics* (3rd edition Calcutta, 1922). He suggests that it was chiefly the *thana* and circle officers who collected the agricultural statistics, but I suspect that the *chaudidars* may have made their returns through the circle and *thana* officers, or, alternatively, that the circle and *thana* officers may have been the primary reporters only for certain kinds of statistic (say yields instead of areas). In any event, circle and *thana* officers do not appear to have helped collect agricultural
statistics until the *Report of the Bengal District Administration Committee 1913–1914* (Calcutta, 1915), suggested that they should—three years after the separation of Bihar from Bengal.

12. The jute inspectorate appointed to check the crop areas which the jute growers' panchayats reported found it more difficult to measure the crop than the Director of Agriculture anticipated. 'Last year', he wrote, 'the country was dry (but) this year practically every field is under water and . . . for an officer to follow the instructions would mean marching all day long knee-deep in water. To reach most of the villages from the road one would have to wade through quite deep water. Mr. Robinson, deputy-director of agriculture, [tried] to follow these instructions [and] is laid up in bed with fever and a touch of the sun. I do not think that any of the other officers, particularly those who have lost their youthful enthusiasm, are likely to endanger their health in the same manner.' Bihar Revenue Proceedings, Agricultural Branch (hereafter BrR-Ag), May 1916, 21–39, in the Bihar State Central Record Office, Patna (hereafter BrSCRO).


14. Bengal Revenue Proceedings, Agricultural Branch, Head Agricultural Statistics (hereafter BrR-Ag Ag Stats), February 1886, Collection 1, File 3, serials 1–21, (WBSA); India Revenue Proceedings, Statistics Branch (hereafter IR-Stats), April 1884, 4–23. C. Macaulay, Secretary to the Government of Bengal, Finance (Statistics) Department, to Secretary to the Government of India, 13 July 1883, in the National Archives of India, New Delhi (hereafter NAI).


17. BrR May 1917, 5–16, Enclosure 1 to serial 15, J. Johnson, Collector Monghyr, to Commissioner, Bhagalpur, 14 February 1917 (BrSCRO).


22. See Papers relating to the Land Records Maintenance Act III (BC) of 1895 (Calcutta, 1895).
24. Kerr, Darbhanga SR, p.141.
31. See, for example, E. Joseph, Rohtak SR, 1905–10 (Lahore, 1911), p.47.
34. Thorburn, Bannu SR, pp.241–2; Glancy, Bannu SR, pp.34–5.
37. Walker, Ludhiana SR, p.267. There were also cliques dominated by money-lending families in Hisar: Townsend, Hisar SR, pp.51–2.
39. ‘The rule requiring the patwaris to reside in their circles was openly disobeyed, and they were in the habit of absenting themselves at pleasure, without
leave, to visit their homes or to attend to their private affairs'; Francis, Ferozepore SR, p. 2.

40. It was said of the patwaris of Panipat tehsil — members of commercial castes resident in the headquarters town—that they 'used to leave the city by one gate as the tahsildar (their official superior) went into camp by the other': Ibbetson, Karnal SR, p. 267.

41. Channing, Gurgaon SR, p. 223.

42. Francis, North Ferozepore SR, p. 2.

43. 'The area contained within these general confines can only be conjectured': Barnes, Kangra SR, p. 1; Diack, Kulu SR, p. 31.

44. J. D. Anderson, Muzaffargarh SR, 1920–25 (Lahore, 1929), p. 11: 'The real trouble [with the kharaba inspection of crop failures] is the difficulty of supervising the Parwaris and Kanungos in an enormous district where much of the cropping is scattered, at times of the year when the heat is extraordinary, and where in the summer inspection of much of the country is impossible on account of floods.'


46. The records of rights were public registries of landownership, and extracts from them were in constant use as evidence of titles and encumbrances in court cases.


48. Details of the system of fluctuating assessment in the canal colonies (and the corruption to which it gave rise) can be found in an informative note by the first colonization officer, F. Popham Young (dated 11 June 1907), in Punjab Financial Commissioner File 44 (III), (PBOR); and in the Report of the Punjab Canal Colonies Committee (Lahore, 1908). The disturbances themselves are the subject of N. G. Barrier's 'The Punjab Disturbances of 1907: the response of the British Government in India to Agrarian Unrest', Modern Asian Studies, 1 (1967), pp. 353–383. On the under-reporting of crop failures, see PSM, p. 163; B. H. Dobson, Chenab Colony SR (Lahore, 1915), pp. 86ff; H. Davies, Gujrat SR, 1888–93 (Lahore, 1893), p. 22.


50. Ibid., pp. 1–2, quoting R. Macanachie, Deputy Commissioner of Gurgaon.


52. This paragraph is based on PGRF 1, 'Rules for Assessments of Land Revenue'; PGRF 77, 'Rules under the Punjab Land Revenue and Tenancy Acts, 1887'; PSM, pp. 24–44; and my general reading of the settlement reports.

53. IORDP vol. 32, no. 819, 1881. For self-regulating settlements, see IORDP vol. 27, no. 2442, 1882; vol. 63, no. 2762, 1883; PGRF 1 (PBOR).

54. IORDP vol. 24, no. 276, 1881; cf. 'A Bengal Civilian', e.g., A. P. MacDonnell, Agricultural and Administrative Reform in Bengal (London, 1883); A. O. Hume (Secretary of the Imperial Revenue Department), Agricultural Reform in India (London, 1879); IORDP vol. 24, no. 270, 1881, especially Richard Strachey's protest, 28 April 1881. Sir John Russell, Report on Agricultural Research in India (Delhi, 1936), contains a short history of the Imperial Department of Agriculture.

55. F. W. Kennaway's resettlement of Gurdaspur was probably the first to employ the district patwaris successfully: Kennaway, Gurdaspur SR, pp. 6ff. But
by no means all subsequent settlements were as successful: for example, Williamson, Gujrat SR, pp.8ff.

56. The transition can be traced in the annual Reports of the Director of Land Records, Punjab (hereafter PLRecR). In the settlement reports, also, the incidence of complaint falls off; some settlement officers even expressing satisfaction with the patwaris, at least after they had reformed them: H. C. Beadon, Delhi SR, 1906–10 (Lahore, 1911); A. J. W. Kitchin, Attock SR (Lahore, 1906), p.21; Ch. Sardar Khan, Attock SR, 1923–27 (Lahore, 1928), p.26; F. C. Bourne, Lower Bari Doab SR, 1927–35 (Lahore, 1935), p.44.

57. PLRecR 1912/13, pp.6–7; PLAM pp.104–15.
58. Ibid., 1913/14, p.7.
59. Ibid., 1912/13, pp.7–8.
60. Ibid., 1922/23, p.9.

61. See the Punjab Government reviews of PLRecR 1919/18, 1920/21, 1931/2, (a ritual recitation of traditional incantations); Peshawar District Gazetteer (Peshawar, 1934).


64. IR–Stats, August 1893, 1–26, W. C. Macpherson, Officiating Director of Land Records, to Secretary to the Government of Bengal, Revenue Department, 14 June 1892; March 1891, 7–8, Keep-with (hereafter KW), ‘F.M.W.S.’ note, 19 January 1891, (NAI); BIR–Ag, November 1892, 1–6; January 1893, 4–5 (WBSA).


66. The different sets of provincial rules for the conduct of crop-cutting experiments are in BIR–Ag, February 1895, 36–49, (WBSA).

67. IR–Stats, March 1892, 7–8, KW, J. W. P. Muir-Mackenzie marginal note, (NAI): the province in which most care was taken was Bombay.

68. BIR–Ag, January 1893, 4–5, (WBSA); cf. IR–General, February 1899, 3, Note by J. A. L. Montgomery, Director of Land Records and Agriculture, Punjab, (NAI); BIR–Ag, May 1898, 13–22, KW, ‘N.W.G.’ note, 14 March 1898 (WBSA): There were not enough cuttings, even of winter rice, in any one district; ‘experiments with important crops have not always been continuous, representative areas and representative crops ... have not always been selected, and ... mistakes have often occurred with regard ... to the state in which the crops were cut’.

69. BIR–Ag, January 1893, 4–5, W. Maude, Officiating Director of Land Records and Agriculture, to Secretary to the Government of Bengal, Revenue Department, 23 October 1891, (WBSA).

70. IR–General, February 1899, 3, KW, J. A. Robertson note, 23 August 1896, (NAI).


74. Note by H. R. Stewart, Director of Agriculture, Punjab, nd but c. December 1937 (in the Darling Papers, South Asian Centre, Cambridge).
75. BrR–Ag, April 1913, 35–39, W. B. Heycock, Director of Agriculture, Bihar, to Secretary to the Government of Bihar, Revenue Department, 3–6 BrSCRO, December 1912.
76. BrR–Ag, May 1917, 5–16; August 1920, 32–3; BrLR February 1929, 12–40, KW, R. E. Russell note, 21 July 1927; (all BrSCRO).
77. Ibid.
78. Government of India, Education Health and Lands Department, Agriculture Branch (hereafter IEH&L–Ag), file 17–3/35A, note by the vice-chairman of the Imperial Council of Agricultural Research (hereafter ICAR), 16 November 1934.
79. PLRecR 1894/5, p.9; PGRF 208.
80. Annual Agricultural Report of the Department of Land Records and Agriculture, Bengal, 1896/7, p.28; 1898/9, p.36; 1903/4, p.15; 1906/7, p.17; BrR–Ag, May 1917, 5–16, H. J. McIntosh, Commissioner Bhagalpur, to Secretary to the Government of Bihar, Revenue Department, 16 February 1917 (BrSCRO); IR–Ag, February 1922, 1–16, KW, G. F. Shirras note, 6 July 1918; May 1909, 50–51, KW, J. O. Miller note, 20 May 1909 (both NAI); PLRecR, 1896/7, p.6.
85. Akhtar Hussain, Gurgaon SR, 1938–43 (Lahore, 1944), p.15; cf. Joseph, Rohtak SR, p.25; PSM, p.165; Trevaskis, Punjab Today, p.199, (‘the subsequent experiments made by the revenue assistants harvest by harvest are perfunctory and pointless’).
87. Ibbetson, Karnal SR, p.58.
89. Quoted by Blyn, op. cit., p.46 n. 11, from Estimates of Area and Yield of the Principal Crops in India, 1940/41, p.46. An earlier, simpler, version can be found in the Manual of Rules for the Preparation of Crop Reports . . . , pp.6–7; and G. F. Shirras, A Manual of Crop Forecasts in India (Calcutta, 1916), p.5, which makes it clearer that it was the mode not the mean that was required. Settlement officers seem to have gone on thinking in terms of ‘averages’. Other definitions also gave trouble, for example land ‘culturable but uncultivated’—which was notoriously difficult to classify consistently.
90. This description of the definition was Sir Frank Noyce’s: Proceedings of the Board of Agriculture in India, 1919 (Calcutta, 1920), p.24.
91. IR–General, February 1899, 3, KW, notes by G. H. R. Hart, 9 June 1897, D. Ibbetson, 12 June 1897; IR–Ag, February 1922, 1–16, W. M. Hailey, Chief Commissioner, Delhi, to Secretary to the Government of India, Department of Revenue and Agriculture, 22 February 1917 (both in NAI); cf., Final Report of the National Income Commission, 1954 (Delhi, 1954), p.27: ‘each patwari has his own conception of the normal crop for his village and there is no way of relating this to the district [normal].
92. IR–Ag, February 1922, 1–16, H. R. C. Hailey, Director of Land Records and Agriculture, United Provinces, to Chief Secretary to the Government of the United Provinces, 19 April 1917, (NAI).
93. As H. K. Trevaskis pointed out, ‘Wheat Forecasts in the Punjab’, Agricultural Journal of India, xix (1924), p.241; cf. J. Wilson, Sirsa SR, 1879–83 (Calcutta, 1884), p.256: ‘In a tract where the produce of the fields varies so enormously as it does in Sirsa, it would be very difficult even for a skilled farmer after an inspection of the whole tract to say what fields represented the average of the harvest, and although the fields were of moderate size... and were chosen with care... the estimate of the average output so framed must be only a very rough one.’ Macanachie, Delhi SR, pp.31–2: ‘the great difficulty is to select fields fairly representing the average conditions of the tract under report.’ Abbott, Jhang SR, p.20: ‘The difficulty lies not so much in ascertaining the weight of an ordinary crop in any year, but in determining the average output of an average crop as harvested by exercising ordinary care.’

96. Hubback, Shahabad SR, p.93.
98. Trevaskis, The Punjab of Today, p.200. Cf. PSM, p.164: ‘To estimate the average yield of each crop on the different classes of land in a tract as large as an ordinary assessment circle is a task of great difficulty. Since the attempt to record soils with any minuteness has been abandoned, it is quite usual to find the land dependent upon rain in a large circle put into a single class. Obviously, the thousands of acres so classified will vary widely in natural fertility, and the average output will be greatly affected by the degree of skill and industry possessed by the cultivators. The yield of different harvests also varies to an extraordinary extent, especially in the case of unirrigated crops.’ Ibbetson (who read mathematics at Cambridge) spelt out some of the implications of the settlement officers’ problem of ‘averaging’: ‘The distinction between an average crop and an average yield has not always been sufficiently recognised. Take all the land of a certain class under a given crop, and... state each different yield that is found to exist, and the average... will give you the average crop; but before the average yield can be obtained, the area on which each individual yield exists must be taken into account. ... Suppose that the rates of yield of a decidedly good, a fair medium, and a distinctly bad crop have been correctly estimated for goira and for unmanured soils: these rates must be treated in very different ways to get the average yield of the two soils... In the goira a bad crop will be a rare exception, and the fair medium crop will hardly recur more frequently than the distinctly good crop. On the unmanured soils, on the other hand, the medium crop will be the commonest, the distinctly bad crop will be found on a very large number of fields, and the distinctly good crop will be comparatively infrequent. Hence there is always a danger of over-estimating the yield of inferior soils; and this danger is enhanced by the fact that, in thinking of the average crop, one is apt to forget the many instances in which the crop has almost or altogether failed.’ Ibbetson, Karnal SR, p.276.
100. Hubback, Shahabad SR, p.122.
101. Ibid., p.283.
102. PSM, p.165: ‘It is hopeless to make in the course of a settlement sufficient experiments to justify an assessing officer in accepting the average results without further enquiry.’ Cf., Currie, Ferozepore SR, p.13; Husain, Gurgaon SR, p.15; Walker, Ludhiana SR, p.194; H. N. Bolton, Dera Ismail Khan SR (Peshawar, 1906), p.18; Beadon, Delhi SR, p.22; H. D. Craik, Amritsar SR, 1910–14 (Lahore,


107. Wilson, Sirsa SR, p.236: ‘I took care, always, to err on the safe side by assuming the average outturns as something less than the observations would seem to warrant.’ Cf., Watson, Hazara SR, p.13: ‘It may be said with fair confidence that if errors have been made they have been made on the safe side.’ Or PGRF 208, L. W. Dane note, 3 May 1913 (PBOR); A. P. MacDonnell, Report on the Foodgrain Supply, p.iii; Kerr, Darbhanga SR, p.131.


109. E. D. Maclagan, Officialising Chief Secretary to Government, Punjab, to Senior Secretary to Financial Commissioner, Punjab, 11 February 1906, reviewing C. M. King, Sirsa and Farzila SR, 1900–1904 (Lahore, 1905). When one particularly independent settlement officer (L. W. Dane) made a genuine attempt to base his assessments on true yields, the financial commissioner—appalled at the resultant pitch of the demand—simply reduced his yields: Dane, Gurdaspur SR, pp.41–2.


111. IR–Ag, March 1915, 12–24, KW, F. Noyce note, 4 November 1914, (NAI).

112. The exact number of annas taken to represent a ‘normal’ crop varied from province to province and time to time.


115. A. L. Bowley and D. H. Robertson, A Scheme for an Economic Census of India (Delhi, 1934), p.36.

116. Ibid., p.37.


121. Ibid., pp.26–7.

123. Hubback, ‘Sampling for Rice Yield’.


125. He retired as Governor of Orissa: his autobiography is in the ICS archive at the South Asian Centre, Cambridge.

126. See the Report of the Crop Planning Conference (Delhi, 1934); the IEH&L-Ag files, 381/36A (on crop restriction generally), 53/34A (rice), 154/33A (sugar), 60–4/39A (jute), all in NAI.


128. The Bihar government file on the jute survey, BrLR, April 1937, 579–600, Part B, J. W. Houlton note, 18 January 1937. The jute panchayats were set up during the First World War: BrLR-Ag, August 1911, 1–11; BrLR-Ag, November 1912, 29–38; February 1915, 12–18; August 1916, 21–39; all in the India Office Records, London. Random sampling failed to give the reliable figures for the small areas needed to ration planting.


132. E.g., Trevaskis, The Punjab of Today, p.410; Stewart note, op. cit; Dane note, op. cit. The Final Report of the National Income Commission suggested a margin of error in its estimate of agricultural income of 20 per cent: this seems a considerable understatement.

133. Annual Report of the Department of Agriculture, Punjab, 1919/20, p.34; PSM, p.162. There are also many expressions of scepticism in the settlement reports already cited.

134. IORDP no. 288, 1902, R. Humphreys, Senior Secretary to the Financial Commissioner, Punjab, to Officiating Revenue and Financial Secretary to Government, Punjab, 6 May 1901.

135. Ibid., T. W. Holderness note, nd; IR–Famine, February 1902, 22–24, KW, A. R. Tucker note, 4 February 1902, J. B. Fuller note, 7 February 1902, (NAI).


137. Bowley & Robertson, op. cit., p.35.


139. Indian Central Cotton Committee, Report on the Accuracy of the All-India Cotton Forecasts of the 1934/5 and 1935/6 Seasons, Statistical Leaflet No. 5, first

140. Indian Central Cotton Committee, General Report on Nine Enquiries into the Village or Extra Factory Consumption of Cotton in India, 1933–6 (Bombay, 1938).

141. Stewart note, op. cit.


143. Ibid., pp.2–6.

144. Ibid., p.6.

145. Ibid., p.5. After independence Indian statisticians conducted a fierce controversy over the reliability of the patuvars' area figures. Those associated with Professor Mahalanobis's Calcutta Statistical Laboratory and the National (Random) Sample Survey denigrated them; another camp—those who had conducted 'complete enumerations' for the Indian Council of Agricultural Research—upheld them. See, for instance, P. C. Mahalanobis and D. B. Lahiri, 'Analysis of Errors in Censuses and Surveys with special reference to India', Sankhya, 23 (1961), pp.329–53.


149. For the imperial secretariat's reluctance to recruit professional statisticians (or economists), see IR–Ag, July 1921, 22–26 (the Board of Agriculture's proposals), IEH&L–Ag, October 1929, 160 (Part B), (The Economic Inquiry Committee), IEH&L–Ag, October 1928, 67 (Part B), (the Royal Commission), IEH&L–Ag, November 1930, 5–6 (the Royal Commission again); and Commerce Department Proceedings, Commerce Branch, file 7-C(12)/36; all in NAI. By 1948 official attitudes were transformed: see R. K. S. Chetty and Rajendra Prasad (finance and agriculture ministers) in Journal of the Indian Society of Agricultural Statistics, i (1948), pp.5, 10.

150. See Professor A. R. Burnett-Hurst's 'Note of Dissent' to the Indian Economic Enquiry Committee Report, pp.91ff.


152. Bowley and Robertson, op. cit., p.89.


GLOSSARY OF INDIAN TERMS

abwab  cess
adhigari  headman of an amsom (q.v.)
aghani  autumn crop
amildari  high pre-British official
amsom  a small administrative area in Malabar, a 'parish', usually comprising
several desams (q.v.)
anna  one-sixteenth of a rupee
arethia  commodity broker
assarhi  pool formed by a dam, used for irrigation in Bihar
assamiswar  cultivation on peasant holdings
ait  religious mediator

badlain  rotational cultivation of indigo
bahi khatas  traders' or patwaris' (q.v.) accounts
bakkal  rural trader
bania  small trader, moneylender, often in a village
banjara  itinerant trader
bazara  market place
bazaza  cloth dealer
beopar (heparith)  trader, merchant
bhadoi  autumn crop
bhoali  a form of rent in kind
bhat  tribe of genealogists and bards
bhit  land above the annual flood level
bigha  unit of area, 1,600 square yards
bohra  Muslim caste

chabutra  platform in front of a building
chapati  unleavened bread
chaudhri  headman of a village, guild, or caste
chaukidar  village watchman
cheri  hut quarter
cottah  one-twentieth of a bigha (q.v.)

dacoit  violent criminal, member of a robber gang
dallal  broker
dakhilla  an advance by a broker on the land revenue
dehat  an indigo factory's area of influence
desam  a 'village' for the purpose of revenue administration in Malabar
dewat puja  worship
**GLOSSARY**

**dharna** ‘dunning’ a debtor by invoking religious sanctions

**diara** land flooded by rivers

**dukan** shop, stall

**fakir** religious mendicant

**faria** ‘huckster’

**farijdar** Moghal ‘police’ jurisdiction

**firman** charter

**ghat** wharf

**ghi** clarified butter

**girdawari** revision of revenue records

**golah** grain market

**gonastah** managing agent

**goonda** violent criminal

**gotra** clan, sub-clan, or sub-caste

**gram** pulse

**gurikal** a Moplah teacher of the use of arms

**hak** right

**hartal** closure of business as a form of protest

**hath** periodic market

**haveli** large house

**hundi** negotiable instrument

**ilaqua** administrative area

**inam** grant of land free of revenue

**inamdar** holder of an **inam** (q.v.)

**jagir** grant of revenue or land

**jagirdar** holder of a **jagir** (q.v.)

**jamabandi** part of a village record of rights

**jana** revenue assessment on a holding

**jati** small caste group

**jenmi** ‘landlord’ in Malabar

**jeth raiyat** leading peasant who helps to collect rents or revenue

**jethawala** commodity storer

**jihad** holy war

**jowari** millet

**kalwar** distiller

**kanam** mortgage tenure of Malabar

**kanamkar** the holder of a **kanam** (q.v.)

**kans** a tough grass

**kanungo** revenue official in Northern India

**kariastan** agent of a landlord

**kazi** Muslim judge
kharaba  crop inspection or measurement
khatri  trading caste
khot  ‘landlord’ in the Konkan region of Bombay
khurda  itinerant money-changer
khuski  the system whereby independent peasants grew crops for planters
kisan  peasant cultivator
kist  instalment of land revenue or rent
kothi  village agent of a higher-level trader
kothiwal  head of a mercantile house, a money-dealer
kotwal  official in charge of a town’s police
kulkarni  village accountant in Bombay
kurtauli  mortgage of a tenant’s occupancy rights to a planter
kutchi khandy  bale of cotton, the number of bales constituting a unit of dealing
kutcherries  offices, courts
lac  dye and resin extracted from an insect
lakh  100,000 (usually written as ‘1,00,000’)
lathial  armed with heavy staves (lathis)

mahajan  merchant
mahamandala  traditional association, usually of merchants in the same trade
mahant  chief priest
malik  yeoman, landlord
mandal  village headman in Bengal
mandi  fall (in the market)
marwari  trading caste from Central India
maund  unit of weight, 26–82 lbs
melcharth  the right to evict a tenant, sold by a jenmi (q.v.)
mofussil  up-country, the interior
mahulla (mahalla)  quarter of a town
mokarrari  permanent lease of an estate
muccadam  commodity handler
mulla  Muslim priest, an expounder of Muslim law
munim  banker’s clerk
munsif  subordinate judge

nai-b-tehsildar  deputy-tehsildar (q.v.)
nuzzar  gift

pakka  proper, superior
pan  betel-leaf
panchayat  council
pandit  Hindu priest
pargana  administrative area
patel  village headman
patta  engagement to pay revenue
pattadar (patidar)  holder of a patta (q.v.)
patwari  village accountant in Northern India
peddaraiyat  leading peasant
pedhi  traditional-type office
phatak bundy  gated area within a city

qistwala (qiswala)  itinerant moneylender

rabi  spring harvest
ragi  millet
rajs  notable
rokahrkhata  cash ledger
ryot (raiyat)  peasant cultivator
ryotwari  land revenue collection from individual ryots (q.v.)

sair  profits of an estate
sahukar  moneylender
salami  fee
sarraf (sarraf)  traditional banker, broker
satta  agreement, contract
satyagraha  passive non-cooperation, a Gandhian mode of political protest
sayyid  Muslim holy man, a descendant of the Prophet
seer  one-fortieth of a maund (q.v.)
seeth  the refuse after indigo is fermented in vats, a fertiliser
shahid  Muslim martyr
shamliat  village land held in common
shroff  same as sarraf (q.v.)
sonar  goldsmith
sowcar (sowcar)  same as sahukar (q.v.)
swadeshi  self-sufficiency
swaraj  freedom

takavi  loan from the government or a landlord
taluk  similar to tehsil (q.v.)
talukdar  large landlord
tangal  descendant of the Prophet (in Malabar)
tatinma shifra  part of a village record of rights
tehsil (tahsil)  administrative sub-division of a district
tehsildar  official in charge of a tehsil (q.v.)
teji  rise (in the market)
teli  oil-presser
thana  administrative area
thika  contract, lease, of an estate
thikadar  holder of a thika (q.v.)
tinkathia  leases conditional on the lessee cultivating part of his holding for the
   lessor, usually three cottahs (q.v.) per bigha (q.v.) of a peasant holding

ulema  Muslim priesthood
vakil lawyer
varna caste
verumpattomdar holder of a verumpattom, or a simple lease of land
zamindar landholder, large or small
zaripeshgi lease or mortgage of the right to collect rent
zerat land under direct cultivation by the landlord